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JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

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Vol. LXIX, N. S. Vol. 22 May,, 1926 No. 2

MINERAL MIXTURES AGAIN

At just about the time when we thought that mineral mixtures had gone out of style—along with mah jong and cross-word puzzles—the subject was presented before the recent Wisconsin veterinary short course, as a "burning issue," by Dr. J. S. Koen, secretary of the Liberty Laboratories. Even though there are some who would like to see the question continue as a live issue, that is far from our intention in referring to the subject here. However, the fact that wide publicity has been given to Dr. Koen's views, through publication of his address in full in a contemporary veterinary journal, we deem it advisable to direct attention to some of the grievous errors of judgment given expression therein.

We have always thought that Dr. Koen really had the very best interests of the veterinary profession at heart—we still think so—but he gave out some mighty poor advice, based on some mighty unsound reasoning, to the veterinarians assembled at Madison on the occasion mentioned. He fell into the same trap, intentionally set to catch other unwary veterinarians who would attempt to tie up ethical publicity for the veterinarian in the same sack with a mineral mixture for the farmer.

Dr. Koen tries hard to defend mineral mixtures and the peddlers, and he predicates his conclusions on the assumptions

that all mineral mixtures are of proven merit; that the indiscriminate feeding of mineral mixtures will do no harm even if it does no good; that veterinarians are the logical distributors —even salesmen—for mineral mixtures; that it is splitting hairs to differentiate between prescribing and peddling; and that it is perfectly ethical and in keeping with professional etiquette to solicit veterinary work, from owners of live stock—perhaps clients of some colleague—but that does not matter.

When Dr. Koen calls on a veterinarian for the purpose of selling him some anti-hog cholera serum or other equally meritorious biological product, does Dr. Koen stress the *financial profit* to be derived by the veterinarian in administering the particular biological product, or does he base his sales talk on the *value* of the product for the purpose it is designed to serve? Most, if not all, of the propositions which have been offered to veterinarians to sell mineral mixtures have emphasized the big profits, almost to the total exclusion of other factors.

As a concrete example we will quote from a letter received by a Michigan veterinarian from the sales manager of a concern prominently identified with the exploitation of mineral mixtures:

> "Ten Veterinarians collected $4,564.25 in commissions during September—an average of $456.42 per man. And what's more, here are the men who did it—(names and amounts follow). Add it up—wouldn't be half bad to take before every meal, would it?
>
> "Every Doctor mentioned above has been with us over a year,—they have all sold big quantities of ———— before, and are now simply "cashing in" on the fine results secured on introductory orders."

Dr. Koen makes the statement that the usefulness of mineral mixtures "has been proven by innumerable experiments by the government and state experiment farms." We would like to have Dr. Koen give us references to the published reports of these experiments. He makes the further statement to the effect that the benefits that have been derived from the use of mineral mixtures have "furnished material for volumes of statistical records and research observations" and that "practically all nutritional experts attest their value." We again invite Dr. Koen to submit a bibliography of references substantiating his statements. It goes without saying that we will be very glad indeed to publish such a list.

For some unexplained reason Dr. Koen was very careful not to say a word about the excellent report of the National Research Council, on "Mineral Nutrient Requirements of Farm Animals." This has been given wide publicity in veterinary

journals, and broadcast through other channels in Dr. Koen's own state.

In brief, the report concludes that the undiscriminating commercial exploitation of the mineral nutrient requirements of farm animals is resulting in an extensive, unwarrantable tax upon agricultural industry; that the inclusion of mineral components in mixed feeds is not warranted, for the reason that these are commonly supplied in normal rations; that the feeding of mineral supplements is advisable only under certain unusual conditions; that there is no need for complicated mixtures; and that natural feeds in the form of leguminous roughage provide the necessary mineral requirements in all but very unusual cases.

Dr. Koen states that it has not yet been demonstrated that the administration of a good mineral product has produced harm, even though no deficiency exists relative to a particular element in the mixture. It is evident that Dr. Koen is not acquainted with recent investigations at one of our agricultural experiment stations, engaged in studying this very question. Dr. Koen will be very disagreeably surprised when the results of these experiments are finally published.

Getting right down to date on this subject, we refer to the remarks made by Professor F. D. Morrison, of the University of Wisconsin, before the United States Live Stock Sanitary Association, in Chicago, in December last. Professor Morrison said that the necessity for farmers using mineral supplements for the purpose of balancing rations depended upon the kind of ration being used. If it was deficient in calcium, then improvement would result from supplying calcium. He went on and gave numerous illustrations of rations that were known to be low in calcium content, ones that were decidedly benefited by supplying lime or calcium. In summarizing, Professor Morrison stated that, if a ration was already a good ration, containing a fair amount of calcium and a fair amount of phosphorus, no particular benefit could be expected by adding to the ration a mineral supplement, containing calcium or both calcium and phosphorus. It is only where a ration *is known to be deficient in some one of these elements* that there is any need for adding this element to the ration. Professor Morrison referred to experiments conducted by the Wisconsin Agricultural Experiment Station, in which animals had been fed a good ration, to which had been added a complex mineral mixture

containing not only calcium and phosphorus but also Epsom salt, Glauber's salt, copperas, sulphur and potassium iodid. This ration was fed during the growing season and in not a single case was there any advantage in the rate of gain or the economy of gain, through the addition of any mineral supplement except common salt.

The opinion is strongly implied by Dr. Koen that it would be perfectly ethical for a veterinarian to drive down the road, scanning the landscape for some unthrifty pigs, some stunted calves or some impoverished lambs and, upon detecting some such animals showing symptoms of needing professional attention, it would be all right for the veterinarian to drive in and solicit some business. This might be all right, if it did not sound so much like the itinerant quack of the past or the nostrum vendor of the present. Would Dr. Koen care to have the professional veterinarian use the same methods that are employed in some parts of the country by these itinerant quacks, who go about looking for "lump jaw" steers, or "sweeneyed" horses, or cases of fistula? The fact that an owner of live stock may be the regular client of another veterinarian is not taken into consideration at all and Dr. Koen would apparently prefer to put veterinary practice on about the same basis as selling automobiles, phonographs, or vacuum cleaners. No suggestion which Dr. Koen might make could possibly be more distasteful or abhorrent to the highly professional veterinarian than this.

Dr. Koen suggests that it would be perfectly proper, in cases of this kind, where the veterinarian had not been actually requested to make a call, to abstract his fee disguised as a commission. In such a case, a veterinarian is not selling his services but he is selling an article of merchandise and his uppermost thought most likely is the big commission, held dazzlingly before his eyes, as an inducement, by some high-powered sales manager. In this connection we might be justified in thinking that Dr. Koen was taking solace from the legal opinion recently given in Iowa to the effect that the taking of such commissions was the equivalent of accepting a fee for practice, when peddlers sold remedies and administered them. Surely Dr. Koen would not uphold the practice of those nostrum peddlers who violate the spirit, if not the letter, of our veterinary practice acts. Yet he advocates that veterinarians compete with these peddlers on their own ground.

We were actually shocked to note that Dr. Koen strongly

discourages the study of pathological conditions for the purpose of making a correct diagnosis, but rather puts a premium on the ability of a shot-gun preparation to relieve any condition confronting the veterinarian. Fortunately, reputable practitioners do not employ such methods. Unhappily for Dr. Koen's argument, deficiency diseases are usually chronic and rarely acute; they do not call for a snap diagnosis; such cases do not need emergency treatment, but usually allow time for careful study and differential diagnosis. What particular advantage is there in calling a veterinarian, if he is going to say that he does not know what the trouble is, and the best he can do is to recommend a mixture of drugs in the hope that one of the constituents will find the right spot? A clerk in a drug store could do as well; many county agents could do even better. Perhaps Dr. Koen has heard of the veterinarian (?) who was called out to a farm where the cows were aborting. Without doing the first thing to satisfy himself that the trouble was not due to infectious abortion, he made a diagnosis of abortion due to a nutritional deficiency and took the herd-owner's order for a ton of a mineral mixture. We assume that he collected both a fee and a commission.

We have no objections to veterinarians quitting practice and going into the business of selling mineral mixtures, or automobiles, or insurance, or what not, but we stand by our guns in the firm conviction that you can not successfully mix the practice of veterinary medicine with the peddling of mineral mixtures any more than you can mix oil and water and get them to stay mixed without constant agitation. We hope that Dr. Koen does not believe that agitation is the proper remedy in this case.

One of the most regrettable parts of the whole matter is that the publication of Dr. Koen's address has given the mineral mixture exploiters another ray of hope. They have grabbed at his remarks like the proverbial drowning man grabs at a straw. And now these exploiters are capitalizing on Dr. Koen's address by flaunting it in the faces of the ethical veterinarians who have refrained from signing on the dotted line, in the hope that they will be won over.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

TWO CONFERENCES

There is nothing like getting together and talking things over, whenever there is some trouble to be ironed out. Recent experiences have convinced us more than ever that there invariably are two sides to every important question. The exchange of views, ideas, and opinions among those who see a particular question from different angles is one of the quickest, easiest and most satisfactory ways for causing differences to disappear.

In this issue of the JOURNAL appears the first published account of a conference held in Chicago, in December last, under the auspices of the Committee on Policy of the American Veterinary Medical Association. This conference was authorized in a resolution adopted at Portland. To the conference were invited some thirty-seven veterinarians in charge of veterinary instruction given to agricultural students in as many colleges of agriculture throughout the United States and Canada. Approximately one-half of these institutions were represented at the conference. Letters were received from practically all of the veterinarians who were unable to attend, in most cases on account of the long distance from Chicago.

The purpose of the conference was to discuss the instruction in veterinary science which is at present being given to agricultural students in the various agricultural colleges. It was believed by the members of the Committee on Policy that it was not generally appreciated how great was the difference in the amount and character of the instruction being given in the various institutions, each one of which was left to its own dictates in the matter, presumably guided largely by local conditions. It was only when direct comparisons were made that these great differences became apparent.

Much has been written and a great deal more has been said concerning the activities of certain graduates of these agricultural colleges, particularly those who take up county agent or agricultural high school work. It has too often happened that these men have been misled into thinking that they have received a course in veterinary science that is comparable with that taken by other students working for a veterinary degree. Numerous instances are known where county agents and high school teachers have presumed to be equipped with sufficient knowledge of veterinary science actually to engage in strictly veterinary work, such as the vaccination of hogs against cholera,

the vaccination of animals against anthrax, the diagnosis and treatment of the numerous ailments of poultry, tuberculin testing, etc. Some have even gone so far as to turn around and teach classes in veterinary subjects. It is only natural to assume that these men have received a wrong idea some place, or that they have been led to believe that they can do things which they have no right to do, or that they have been given certain knowledge which they should feel free to use whenever the opportunity is offered.

Therefore, with only the very best of intentions, some three dozen veterinarians got together and devoted over four hours to a very serious consideration of how best to correct this condition. It is to be said right here that practically every one of the men present entered into the spirit of the occasion and the members of the Committee on Policy have since received many expressions of approval for this start made by the Committee. It is not believed for one moment that the veterinary instruction given to agricultural students is responsible for all of the petty annoyances and irresponsible meddlings, not to say serious encroachments upon their work, with which veterinarians in many parts of the country have had to put up during recent years. The members of the Committee know that there are other problems ahead, many of them much more difficult of solution than this one. With the support of the membership at large, it is the intention of the Committee to tackle these problems, one after the other, until they have been disposed of, in some way at least.

In keeping with this whole general idea of "getting together and ironing things out," invitations have been sent out, through the secretaries, to every state and provincial veterinary association in the United States and Canada, to send an accredited representative to a conference to be held in Lexington, Kentucky, August 16, 1926. This conference will be held for the purpose of discussing plans for securing a closer cooperation between our state and provincial associations on the one hand and the American Veterinary Medical Association on the other. The conference will not have any particular official status, but it is hoped that the various representatives will bring many constructive criticisms and suggestions mutually beneficial to the individual associations and to the A. V. M. A., and particularly for the guidance of the Committee on Policy of the national organization.

Although we have been in more or less constant correspondence, during recent years, with the secretaries of the larger associations and although much good has resulted from the exchange of ideas in this way, the benefits to be derived from writing letters are not to be compared with those which we may expect to result from a conference such as the one proposed. If you are a member of your state or provincial veterinary association, take it upon yourself to find out whether your association is going to be represented at the conference in Lexington. It is hoped that, when the roll is called, not a single association will be silent through having no representative present.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

FORCE OF HABIT

The following editorial, referring to the congressional appropriation for another edition of "Diseases of the Horse," recently appeared in the Washington *Post:*

> "From sheer force of habit an antiquated majority in the House of Representatives votes $200,000 for the distribution of a horse book, and we can only hope that the more up-to-date Senate will substitute for this a treatise on spare parts."

Considering the fact that owners of automobiles spent more money for new piston rings, during 1925, than the owners of live stock spent for veterinary services, we believe that the suggestion of the editor of the *Post* is quite apropos.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

KENTUCKY VETERINARIANS PREPARING

The Local Committee on Arrangements for the Lexington meeting, complete personnel of which was announced in the April issue of the JOURNAL, is now completely organized and hard at work. Dr. W. W. Dimock, chairman of the Committee, announces the following sub-committees and their chairmen:

Exhibits: Dr. F. E. Hull, Univ. of Ky., Lexington.
Clinics: Dr. Chas. Hagyard, Lexington.
Hotels: Dr. T. P. Polk, Lexington.
Reception: Dr. D. E. Westmoreland, Owensboro.
Registration: Dr. W. H. Simmons, Frankfort.
Banquet: Dr. R. L. Pontius, Lexington.
Finance: Dr. A. J. Steiner, Lexington.
Publicity: Dr. M. Scherago, Univ. of Ky., Lexington.
Entertainment for Ladies: Mrs. W. W. Dimock, Lexington.
Entertainment for Men: Dr. E. M. Stemmler, Lexington.

OUT OF TUNE

As an example of the discordant notes which all too frequently find their way to our ears these days, we quote the following paragraphs from the introduction to Technical Bulletin No. 27, published by the North Carolina Agricultural Experiment Station:

> The information of the average poultryman as to poultry diseases is meagre. Many times disease outbreaks are allowed to become well established before the seriousness of the condition is recognized, and then efforts at eradication of the disease are usually unscientific and ill handled, and heavy loss ensues.
>
> A rapid correction of such conditions is impossible. It must be brought about by education through all possible agencies. Thorough training of County Agents and Agricultural High School teachers in the prevention and diagnosis of poultry diseases, and a coördination of the extension and experiment station activities with such agencies should be helpful in reducing the high mortality rate that is found in the poultry industry today. It is on the hopes of a brighter tomorrow that the efforts of today are founded.

The senior author of the bulletin in question is a prominent veterinarian, whose name is a familiar one to many members of the profession. Just how it happened that the veterinarian was completely overlooked as an important—if not the most important—factor in the prevention and diagnosis of poultry diseases is hard to figure out.

THE PORTLAND PAPERS

In this issue we complete the publication of the papers and addresses, some forty-three in number, delivered at the meeting in Portland last summer. It has been no easy task to get these in shape for publication, to say nothing of the rather lengthy discussions which followed the reading of some of the papers. In publishing these contributions, an attempt has been made to group the papers on related subjects. To the Portland papers have been added those received, from time to time, from other sources, with the result that we have been able to publish several special numbers. These have been designated "Bovine Pathology," "Avian Pathology," and "Small Animal Practice" numbers. During this period the "Proceedings Number" appeared, as well as five "balanced" numbers on mixed subjects. Quite a few very nice compliments have been received, praising our special numbers. This is particularly true of the "Bovine Pathology Number," which appeared in January, and our "poultry" number the following month. The latter, as well as its companion of a year ago, attracted world-wide attention. How do you like the special issues?

EXECUTIVE BOARD ELECTION

The election of a member of the Executive Board for District No. 6, now in progress, shows indications of being the most spirited election we have had for some time. The ballots calling for nominations were mailed on February 17 and the polls closed on April 17. On the same date the election ballots, containing the names of the five nominees, were mailed to all paid-up members in the District.

History has again repeated itself, to a certain extent, at least. Two of the nominees this year were also on the ticket four years ago. The candidates in 1922 were presented from Kansas, California, Missouri, Arkansas and Texas; this year from Kansas (two), California, Missouri and Texas. There were 359 votes cast in 1922. This year ballots were mailed to 529 members in the District. The nominees are:

CONRAD, B. W. — Sabetha, Kansas

Practitioner. Graduate of Kansas City Veterinary College, 1907. Joined A. V. M. A., 1908. Member of Executive Board, District No. 6, 1921-1926.

DYKSTRA, R. R. — Manhattan, Kansas

Dean, Division of Veterinary Medicine, Kansas State Agricultural College. Graduate of Iowa State College, 1905. Joined A. V. M. A., 1912. Member Committee on Necrology, 1919-20 and 1922-23; member Committee on Resolutions, 1924-26.

HART, GEORGE H. — Berkeley, California

Professor of Veterinary Science, University of California. Graduate of University of Pennsylvania, 1903. Joined A. V. M. A., 1910. Fifth vice-president, 1915-16; fourth vice-president, 1922-23; third vice-president, 1918-19 and 1923-24; member Committee on Intelligence and Education, 1916-19; resident secretary for California, 1917-19; member (1922-24) and chairman (1924-25) Committee on Prevention of Transmissible Diseases of Animals.

KINSLEY, A. T. — Kansas City, Missouri

Pathologist. Graduate of Kansas City Veterinary College, 1904. Joined A. V. M. A., 1904. Fourth vice-president, 1910-11; president, 1921-22; member-at-large, Executive Board, 1917-21; member Committee on Diseases, 1908-09, 1910-11, 1912-13, 1915-16; member Committee on Intelligence and Education, 1911-12; member Committee on Legislation, 1916-17; member Committee on Prevention of Transmissible Diseases of Animals, 1925-26.

WILLIAMS, N. F. — Fort Worth, Texas

State veterinarian of Texas. Graduate of Kansas City Veterinary College, 1911. Joined A. V. M. A., 1917. Secretary, Section on Sanitary Science and Police, 1925-26.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

APPLICATIONS FOR MEMBERSHIP

(See April, 1926, JOURNAL)

FIRST LISTING

AMSHER PETER I. 292 Monroe St., New York, N. Y.
D. V. S., New York-American Veterinary College, 1911
Vouchers: Robt. S. MacKellar and W. Reid Blair.

BARRETT, LAWRENCE DEAN 715 Arch St., N. S. Pittsburgh, Pa.
D. V. M., Ohio State University, 1925
Vouchers: Samuel E. Young and Leonard W. Goss.

BINGHAM, ALVIN BYRON Box 303, Middleport, Ohio
D. V. M., Ohio State University, 1919
Vouchers: Leonard W. Goss and O. V. Brumley.

CASTLEBERRY, W. B. 1129 Brown-Marx Bldg., Birmingham, Ala.
D. V. M., Alabama Polytechnic Institute, 1923
Vouchers: M. L. Boevers and D. A. Piatt.

CRAVER, NEVIN S. 234 Holmes St., Youngstown, Ohio
D. V. M., Ohio State University, 1921
Vouchers: Leonard W. Goss and O. V. Brumley.

ELLERTSON, JAMES A. 34 River St., Madison, Ohio
D. V. M., Ohio State University, 1919
Vouchers: Leonard W. Goss and O. V. Brumley.

FRANK, EDWARD R. K. S. A. C., Manhattan, Kans.
D. V. M., Kansas State Agricultural College, 1924
Vouchers: Edwin J. Frick and R. R. Dykstra.

GILBERT, RAY D. Gettysburg, Ohio
D. V. M., Ohio State University, 1916
Vouchers: Leonard W. Goss and O. V. Brumley.

GREGORY, R. TODD Box 127, Moundsville, W. Va.
D. V. M., McKillip Veterinary College, 1918
Vouchers: S. E. Hershey and H. M. Newton.

HEIDEN, LESLIE J. 515 So. 10th St., Escanaba, Mich.
D. V. M., Michigan State College, 1923
Vouchers: F. K. Hansen and B. J. Killham.

HOBBS, WALTER ROMEO 1122 Lincoln Road, Columbus, Ohio
D. V. M., Ohio State University, 1914
Vouchers: Leonard W. Goss and O. V. Brumley.

JACKMAN, JOHN A. 124 So. Washington Ave., Columbus, Ohio
D. V. M., Ohio State University, 1919
Vouchers: Leonard W. Goss and O. V. Brumley.

JACKSON, M. F. 1129 Brown-Marx Bldg., Birmingham, Ala.
V. S., Ontario Veterinary College, 1905
Vouchers: M. L. Boevers and D. A. Piatt.

JAY, ROBERT Box 338, Sacramento, Calif.
D. V. M., McKillip Veterinary College, 1899
Vouchers: J. R. Beach and S. O'Toole.

LYONS, WM. FRANCIS R. F. D., No. 4, Coshocton, Ohio
D. V. M., Ohio State University, 1925
Vouchers: Leonard W. Goss and O. V. Brumley.

McCULLOUGH, HUGH Canadian Packing Co., Peterboro, Ont.
V. S., B. V. Sc., Ontario Veterinary College, 1910
Vouchers: F. H. S. Lowrey and L. A. Willson.

MARTIN, EDWARD DAVID 91 West 10th Ave., Columbus, Ohio
D. V. M., Ohio State University, 1911
Vouchers: Leonard W. Goss and J. H. Rietz.

MEREDITH, CLARENCE D. 521 Virginia, Joplin, Mo.
D. V. S., Kansas City Veterinary College, 1904
Vouchers: Ralph Graham and H. A. Wilson.

MERRICK, BYRON P. Berlin Heights, Ohio
D. V. M., Ohio State University, 1923
Vouchers: Leonard W. Goss and O. V. Brumley.

MERRICK, JAMES R. 245 No. Pleasant St., Oberlin, Ohio
D. V. M., Ohio State University, 1922
Vouchers: Leonard W. Goss and O. V. Brumley.

NICHOLS, THEODORE EARL 829 E. Whittier St., Columbus, Ohio
D. V. M., Ohio State University, 1921
Vouchers: Leonard W. Goss and Russell E. Rebrassier.

PETTEYS, CHARLES E. Weston, Ohio
D. V. M., McKillip Veterinary College, 1917
Vouchers: E. V. Hover and Leonard W. Goss.

SEELEY, MILTON JAMES 316 So. Pleasant Ave., Lodi, Calif.
D. V. M., B. Sc., State College of Washington, 1921
Vouchers: Geo. Gordon and S. O'Toole.

STEENERSON, T. L. Wilkinson, Ind.
D. V. M., Ohio State University, 1924
Vouchers: R. C. Julien, Geo. W. Gillie and Leonard W. Goss.

WARDLOW, ALPHA EARL Box 338, Sacramento, Calif.
D. V. M., Ohio State University, 1917
Vouchers: W. J. Lembke and C. R. Behler.

WATTS, CHARLES C. Pataskala, Ohio
D. V. M., Ohio State University, 1914
Vouchers: Leonard W. Goss and O. V. Brumley.

WHITE, A. B. Box 114, Grove City, Ohio
D. V. M., Ohio State University, 1917
Vouchers: Leonard W. Goss and O. V. Brumley.

WILHELM, ALLEN A. 128 E. Tiffin St., Fostoria, Ohio
D. V. M., Cincinnati Veterinary College, 1920
Vouchers: Leonard W. Goss and O. V. Brumley.

Applications Pending

SECOND LISTING

Bacus, James E., Pukoo, Molokai, Hawaii.
Caldwell, C. P., c/o Health Department, Durham, N. C.
Hoefflin, Carl, 41 Cliff St., Ottawa, Ont.
Huffman, Robert P., Box 733, Wilmington, N. C.
Ingram, Sherman R., Fort Clark, Texas.
Luh, August C., Victoria, Mo.
McCue, G. P., 114 4th Ave., S. W. Aberdeen, S. D.
Moore, A. A., 301 So. Kansas St., Edwardsville, Ill.
Moore, William, c/o N. C. Dept. of Agr., Raleigh, N. C.
Porter, Armer, Fredonia, Kans.
Spearman, Harold, Stittsville, Ont.
Van Roekel, Henry, Box 325, Blackburg, Va.

REINSTATED

Jones, Frank R., c/o Globe Laboratories, Fort Worth, Texas.
Steiner, A. J., Lexington, Ky.

The amount that should accompany an application filed this month is $8.33, which covers membership fee and dues to January 1, 1927, including subscription to the JOURNAL.

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. May 5, 1926. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

Connecticut Veterinary Medical Association. Waterbury, Conn. May 5, 1926. Dr. Geo. E. Corwin, Secretary, 11 Warrenton Ave., Hartford, Conn.

Michigan-Ohio Veterinary Medical Association. Adrian, Mich. May 6, 1926. Dr. Walter H. Rozine, Secretary, Morenci, Mich.

Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. May 11, 1926. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.

Hudson Valley Veterinary Medical Society. Catskill, N. Y. May 11, 1926. Dr. Wm. H. Kelly, Secretary, 233 Western Ave., Albany, N. Y.

Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. May 18, 1926. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.

Missouri Veterinary Medical Association. Hotel Claridge, St. Louis, Mo. May 18-19-20, 1926. Dr. Fred C. Cater, Secretary, Sedalia, Mo.

Massachusetts Veterinary Association. Massachusetts Agricultural College, Amherst, Mass. May 21, 1926. Dr. H. W. Jakeman, Secretary, 44 Bromfield St., Boston, Mass.

Keystone Veterinary Medical Association. Philadelphia, Pa. May 26, 1926. Dr. C. S. Rockwell, Secretary, 5128 Chestnut St., Philadelphia, Pa.

Northeastern Indiana Veterinary Medical Association. Columbia City, Ind. June 16, 1926. Dr. O. E. Blackburn, Secretary, Harlan, Ind.

Indiana-Illinois Veterinary Medical Association. Merone, Ind. June 18, 1926. Dr. M. W. Scott, Secretary, Vincennes, Ind.

Michigan State Veterinary Medical Association. Michigan State College, East Lansing, Mich. June 22-23-24, 1926. Dr. E. K. Sales, Secretary, 535 Forest St., East Lansing, Mich.

Eastern States Tuberculosis Eradication Conference. Burlington, Vt. June 22-23, 1926.

Vermont Veterinary Medical Association. Burlington, Vt. June 22-23, 1926. Dr. Geo. Thomas, Secretary, Bradford, Vt.

North Carolina State Veterinary Medical Association. Raleigh, N. C. June 23-24, 1926. Dr. W. A. Hornaday, Secretary, Greensboro, N. C.

California State Veterinary Medical Association. Los Angeles, Calif. June 28-29-30, 1926. Dr. E. H. Barger, Secretary, University Farm, Davis, Calif.

New York State Veterinary Medical Society. Cortland, N. Y. June 29-30, 1926. Dr. C. E. Hayden, Secretary, 110 Irving Place, Ithaca, N. Y.

PARASITIC AND NON-PARASITIC DISEASES OF THE EARS IN THE CANINE AND FELINE*

By FREDERICK RANDOM WHIPPLE, *Peoria, Ill.*

The above subject is the title of a paper which was selected and, but for his untimely death, a few weeks ago, would have been presented here today by Doctor W. A. Boucher, of Pasadena, California. The subject is not one that I would have chosen voluntarily, but having been called upon to fill another's place at a late date, I am confining myself to those diseases of the ear, which we meet from day to day in small animal practice, and I shall draw freely from our literature relating to the subject.

Twenty years ago, if asked, "What are the diseases of the ears of dogs and cats"' most of us would have answered, "Wounds and canker." But the past few years have brought unexpected interest in these animals; and a desire of the public to own pure-bred pets has in turn created the canine and feline specialist, whose ability to differentiate and diagnose many of the diseased conditions is improving by leaps and bounds; and probably no profession has developed so rapidly, or has been placed on a more scientific basis, than that of the small animal specialist.

This great wave of interest in pets, on the part of the general public, has created such a demand for expert veterinary service in treating their diseases that today a new field has been opened, and many veterinarians in the larger cities have limited their practice to small animals. Specializing has increased our knowledge. We are treating, as every-day diseases of dogs and cats, conditions that were not known to exist twenty years ago.

Only a few short years ago appendicitis in the human was found only at autopsy, and when a death certificate was required, it read, "Inflammation of the bowels." Today we are not satisfied with locating the diseased organ. We seek to make an exact diagnosis of the condition and utilize all of the methods known for making a specific diagnosis. Whereas, only a few years ago, we were treating most ear cases as "canker," we are today successfully recognizing and treating diseases of the ear previously found only in human medicine.

*Presented at the sixty-second annual meeting of the American Veterinary Medical Association, Portland, Oregon, July 21-24, 1925.

As in any branch of our profession, together with knowledge of the subject, certain equipment is necessary to enable us to diagnose and treat successfully diseases of the ears, chief of which are: the otoscope, the microscope, and the X-ray.

The Otoscope

The most appropriate otoscope for small animal work is an instrument which combines both speculum and magnifying lens and is supplied with a small electric bulb for illuminating the cavity in which the instrument is inserted. Of the different patterns of otoscopes with which I am familiar, mention is made of:

1. The Welch Allyan Company's otoscope.
2. The Electric Surgical Instrument Company's otoscope.

Both the above-mentioned instruments, together with other instruments used in aural work, have been furnished me by Sharp & Smith, Chicago, Illinois, without great expense. This firm is displaying, at this convention, each of the instruments I use in aural work.

As the external ear furnishes much of our aural work, by reason of its diseases and abnormalities, and in consideration of the fact that many of our examinations and treatments must be through the external canal, its careful study is requisite in otology. True, many of these cases are wounds, inspissations of pus, and eczematous inflammations, but the more rare affections occur frequently enough to justify a brief discussion.

Malformations: Many are only of embryologic interest, but the rudimentary development or even the absence of the auditory canal may bring to us the question of surgery, generally for a negative answer. While a crumpled auricle possibly can be straightened by an operation, and a covered canal can be opened, yet exploration often fails to disclose the canal; and the tympanum or other of the organs of hearing even may be wanting.

Injuries and wounds: Traumatisms are met very frequently, often the result of a dog or cat fight. During the hunting season, we often are called upon to treat injured ears in the hunting breeds, which have been shot accidentally, or the ear injured by coming in contact with a barb-wire fence. Serious abscess formation frequently results from the tooth puncture and often extensive sloughing and deformity of the pinna occurs. These require surgical attention.

Tumor Formations

In both the dog and cat tumor formations are met with and quite frequently they are cystic in character. Among these are:

Conchal hematoma: A condition in which, as a result of a local injury, there has occurred an effusion of sanguineous lymph between the cartilage and the skin. It is a condition apparently induced by very slight injuries, and is generally found in long-eared breeds; but the prick-eared breeds and even the cat are far from being free of it. There have been cases met with in my work in which I was inclined to give credit to an altered lymphatic circulation as an exciting cause. Hematoma may cause deformity of the cartilage when not promptly and judiciously treated.

Papillomata: Usually found on the internal surface of the ear flap, but may occur deep down in the canal and appear as cauliflower-like growths.

Polypi and cysts: Recognized by their smooth and rounded or elongated formation and by the character of their contents.

Fibromata: These I have met a few times and in each case they have been of keloid formation.

Malignant growths: While not common in either the dog or the cat, malignant tumors are met with, probably more frequently in the cat.

Foreign bodies in the ears of the dog and cat can be almost excluded from our consideration, because of the fact that when introduced the power which these animals have to shake their heads will soon dislodge most foreign bodies. Frequently, I have removed "wood ticks" from the ear canal, and once manual attention was required for a misdirected BB shot from a small boy's air-rifle.

Inspissated cerumen seldom should be regarded as an incidental retention of the normal ear-wax. Wax is lacking wholly in suppurating ears, although brownish inspissated pus is easily mistaken for it. The wax-glands are wanting in the deep external canal and when found deep down in the canal should be considered as foreign bodies. The normal, healthy, deep-ear canal needs no artificial cleansing. Nature has provided that the epithelium of the center of the ear-drum shall grow faster than at any other point, hence it tends to overgrow its surroundings, pushing the older cells along the canal wall, and this outward growth carries all foreign material away from the tympanic membrane. Thus, it will be seen that one of the functions

of the ear-wax is to agglutinate flaky material and, with the motion of the jaw to the ear canal, convey these particles to the exit. When some defect of the normal canal exists, collections of wax may fill the ear-canal and, pressing down upon the ear-drum, cause inflammation of that membrane, resulting in deafness and even symptoms of vertigo. Collections of wax also form a favorable soil for bacterial growth and are often the beginning of the so-called "canker" cases.

Eczema

Auricular eczema affecting the auricle is rather a common disease in catteries, especially in the uncared-for and ill-fed young animal. We recognize and differentiate two forms, the acute and the chronic. In the acute form we meet with:

First. The erythematous stage, in which the skin of the ear is very red and swollen, frequently causing the erect pinna to droop.

Second. The vesicular stage, in which the skin is more or less covered with vesicles from which serum exudes, finally drying in the form of crusts or scabs.

In the chronic form we often find the eczema extending into the auditory canal and the skin covered with dry scales, removal of which exposes a sensitive and easily irritated surface. In this type the auricle is thickened.

Deafness is a condition to be considered under two headings:

1. Congenital.
2. Acquired.

There is little to be said regarding congenital deafness, beyond facts relating to heredity. In the acquired forms of deafness some one of the following causes occurs:

1. Toxic. As an example, the deafness which may follow improper administration of oil of chenopodium as a vermicide.
2. Circulatory disorders.
3. Closure of the external auditory canal.
4. Paralysis of the auditory nerve.
5. Intracerebellar affections.
6. Diseases of the ear-drum.
7. Diseases of the deep-ear cavities.
8. Tumors.
9. Infectious diseases.
10. Hemorrhages.

The prognosis in cases of deafness depends upon removal of the cause and in the congenital form is most unfavorable. In the acquired form, the prognosis may be favorable and hearing may be partially or wholly restored by correcting any diseased condition, which may have caused the loss of this special sense.

Otitis and Otorrhea

Of all ear diseases we meet most often the acute and chronic inflammatory conditions of the external ear-canal. The condition may affect only one ear; but quite often both ears are affected, and while the long-eared dog is more often affected, the short-eared breeds and the cat are far from free from otitis. The condition may be brought about by a variety of causes, such as accumulations of cerumen and dirt, or a purulent otitis media, or it may develop as a result of direct violence, as not infrequently occurs as the result of dog and cat fights. Otitis occurs in the course of infectious diseases and as an eczematous condition. Of the pyogenic bacteria mention is made of the streptococci, staphylococci, *Bacillus pyocyaneus*, specific bacteria of infectious diseases and both animal and vegetable parasites.

Otitis media: A condition affecting the inner ear or labyrinth, and one frequently mentioned in our text-books as seldom met with. I can not agree with those making this statement, for when careful examinations are made with the electrically lighted otoscope, we will find internal ear diseases. That the Eustachian tube can carry infection to the middle ear will not be doubted, or the fact that acute throat lesions and exhausting infectious diseases predispose to middle-ear infections can be substantiated by carefully performed postmortems. Rupture of the tympanic membrane is not infrequent in the course of distemper.

Acute mastoiditis: Mastoiditis is practically always secondary to a suppurative lesion in the middle ear, and may be described as an acute inflammatory process originating in the antrotympanic cavity and spreading thence to the mastoid cells proper. The symptoms of mastoiditis are usually engrafted upon those of acute purulent otitis media. We have, therefore, to ask ourselves what symptoms, or modifications of symptoms, occurring during an attack of acute, middle-ear suppuration, or during convalescence therefrom, should lead us to suspect suppurative involvement of the mastoid cells. In fact, the symptoms to be looked for are mastoid pain, elevation of temperature, certain quantitative changes in the character of the discharge,

mastoid tenderness and bulging of the postero-superior canal-wall.

Parasitic Ear Diseases

The canine and feline aurist meets, from time to time, diseases of the ears which are caused by:

1. Animal parasites.
2. Vegetable parasites.

Of the animal parasites the more common are:

1. Fleas, lice and flies.
2. Sarcoptes of the dog.
3. *Notoedres cati.*
4. *Otodectes cynotis.*
5. *Otodectes cynotis* var. *cati.*
6. The Spinose ear tick.
7. The American dog tick.

Of the vegetable parasites, two are more or less common and are often referred to as "ringworm" and "favus," the former caused by *Trichophyton tonsurans* and the latter by *Achorion schonleinii.*

Clinically, fleas, flies and lice produce the same results, namely, dermatitis of the ears, which at times may become quite serious. Due to the animal's efforts—scratching and rubbing the ears—hematomata at times develop, especially in long-eared dogs, due to the continual flapping of the ears.

Auricular Mange

The *Sarcoptes scabeii* var. *canis* and *Notoedres cati* var. *cati* are the most frequent of the mange mites, attacking the dog and cat. Mange in the cat is to be considered a serious condition and not infrequently causes the death of the animal. While notoedric mange usually begins on the back of the neck, it soon spreads to the ears and, if present in the ear-canal, will cause otitis. Sarcoptic mange of the dog does not appear to be transmitted to the cat, but notoedric mange is transmissible to the dog, and is the smaller mite of the two mentioned. Both of these parasites burrow into the skin, while the *Otodectes* do not burrow. (For complete description of these parasites, I refer you to Bulletin 338, U. S. Department of Agriculture.)

Otodectes cynotis and *Otodectes cynotis* var. *cati* are the true ear-mange mites affecting the dog and cat. Although the species affecting the cat is generally considered to belong to the same species as that affecting the dog, the Bureau of Animal Industry

considers each a distinct variety. The condition presents a similar clinical picture in both the dog and cat. The irritation due to the invasion of the parasites sets up an otorrhea of the external ear-canal, manifested by the discharge of a dark-colored and offensive exudate, pruritus, ulceration of the ear-flap and auditory canal. The patient continually shakes its head, scratching at the affected ear, or rubbing it along the ground. Upon close examination the parasite can usually be seen moving about in the debris. Infection may extend to the middle ear and to the meninges, when symptoms of cerebral lesions will develop. Nervous lesions are more frequently found in the feline subject, and many so-called cases of fits in kittens can be traced to the true ear-mite.

The Spinose ear tick (*Ornithodoros megnini*) will be of more interest to the veterinarian residing in the territory extending from Oregon to Texas, especially in what is known as the semi-arid regions. Among domestic animals this tick is found most frequently in the ears of cattle, horses, dogs and sheep and under favorable conditions including man. Serious damage is caused by this parasite and it is not unusual to find as many as eighty ticks in the ear. As this parasite belongs to the blood-sucking variety, otitis very often results from the parasitic puncture of the tender skin.

Otomycosis describes the condition in which some form of mould has found lodgment, and in which conditions are favorable for its development in the external ear-canal. Careful study of ear-canal diseases will reveal this agent as one of the causes of otitis. Upon close inspection of the ear-canal with the aid of the otoscope, there is revealed a different picture according to the form of mould present, and the stage of its development. The ear-drum may be covered with an adherent growth, the color of which may vary from a dark gray or black to a yellow, as in flavus. One variety produces a green color and might be mistaken for *Bacillus pyocyaneus* infection.

Prescriptions Used in Treating Ear Diseases

Cleansing solutions:

℞

Acidi borici	gr. xx
Spt. vini rect.	℥ i

M. et ft. solutio

Alcoholic solution of mercuric chlorid 1-4000

Local anesthetic:

Solution of cocain hydrochlorid 4%

Astringent solutions:

℞

Acidi tannici	gr. xv
Spt. vini rect. dil.	ʒ i

M. et ft. solutio

Burrow's solution

Solution of zinc sulphate 5%

Antiparasiticide solutions:

℞

Ol. cadini	ʒ i
Ol. olivae	ʒ vii

M. et. ft. mist.

℞

Ichthyolis	
Glycerini	āā ʒ *ss*

M. et ft. solutio.

℞

Acidi salicylici	gr. xv
Spt. vini rect.	ʒ i

M. et ft. solutio.

Ointments:

Sulphur ointment

Yellow oxid of mercury ointment 2%

Mercuric chlorid 1-300

℞

Ung. ichthyolis	
Ung. zinci oxidi	āā

M. et ft. ung.

Antiseptic drying powder:

Boro-calendula-hydrastis compound powder.

This is a preparation I have used for many years in all wound dressings calling for a drying antiseptic powder. It is excellent to use as the basis for calomel, bismuth and zinc oxid in treating ear diseases. Being soluble, in solution it makes a very good cleansing fluid.

Mercurochrome, which is one of the newer dye antiseptics, in 2-3 per cent solution, is meeting with much favorable comment. Other solutions to be mentioned are the salts of silver and picric acid.

The following instruments are necessary to meet the everyday ear treatments:

Wood applicators.
Curettes both sharp and dull.
Sharp ear-hook.
Ear-spoon.
Ear-syringes.
Wire snare.
Noye's ear scissors.
Noye's ear forceps.
Cautery handle and electrodes.

In closing I wish to say that in the passing of Doctor Boucher, we have had taken from our ranks one who was always interested in small animal practice and one who enjoyed the respect and confidence of all who came in contact with him. If I have covered, in a measure, the subject as he would have done, if here today, then I am most happy in having been selected to present Doctor Boucher's subject.

DISCUSSION

DR. F. H. MCNAIR: Mr. Chairman, in our western country our most common cause of ear disease is the foxtail or the wild barley. In the two years' experience that I had in the Cornell veterinary clinic, as assistant, I had less ear trouble in small animals in those two years than I have had in a similar two or three months on the Coast. Of course, you Middle West men would not have that to deal with. I would like to ask Dr. Whipple if he has ever seen a case in a dog of what he was satisfied was true mastoiditis.

DR. WHIPPLE: I certainly have, but not every day, of course. I have had not only one but several cases where the mastoid was involved. Dr. Guard has met with mastoiditis quite frequently in the dog, the hog, and the bovine.

DR. R. A. BUTTON: What has been, in your experience, the best treatment for otodectic mange in the cat that you spoke of? What treatment have you been using?

DR. WHIPPLE: About the only remedy that I use is oil of cade, one part to seven of olive oil; applications of it daily or every other day. I sometimes use sulphur ointment around the opening of the ear, but I depend upon the oil of cade. That has given very good results.

DR. BUTTON: What is the life cycle of that parasite?

DR. WHIPPLE: I am not familiar with it. I will refer you to Bulletin 338 just published by the Bureau of Animal Industry.

DR. B. D. KENNEDY: Have you located this parasite with the otoscope?

DR. WHIPPLE: You may be able to see the parasite with the naked eye and very plainly with the magnifying lens of the otoscope. It is one of the largest of the mange parasites.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

INTERNAL PARASITES OF THE CANINE AND FELINE*

By FRED D. PATTERSON, JR., *Auburn, Ala.*

It is the purpose of this paper to try to present a brief summary of the subject of internal parasites of the canine and feline. No attempt will be made to give detailed descriptions of species, laboratory methods or therapeutic agents used. Only the most important anthelmintics will be discussed and principally those which have been used by the writer. This paper is intended to be a practical presentation of the subject. A detailed discussion is out of the question in a paper of this kind, as the time allotted will not permit and it is also unnecessary, for we have sufficient literature upon the subject which can and should be consulted for more detailed descriptions and methods.

The subject of parasites is a very imporatnt one in the South. In fact, parasites are so common, often occurring in such large numbers, and presenting such a varied group of symptoms, and so often severely complicating other diseases, that I feel safe in saying that in the South, at least, no other menace to the dog, less so to the cat, is greater than that of parasitism. There still remains much to be worked out upon the subject, and I know of no other field in our profession that offers more possibilities to the research worker.

ASCARIDAE

We will now enter into the subject matter proper, first taking up the Ascaridae, as they are probably the most common, especially in puppies. There are two species of this group, commonly termed the large roundworms, the more important of these being the *Belascaris marginata*, the other *Toxascaris limbata*. From a practical point of view it is unnecessary to separate the two species. The *Ascaris* infests the small intestine of the dog, gaining entrance into the digestive tract in the egg-stage, by means of contaminated food and water. Suckling puppies get the eggs from the teats of the mother, and we now have fairly good evidence that the puppies are sometimes born with them, this being explained by the migratory habits of the larvae of the parasites. Eggs are supposed to go through a certain incubation stage, outside of the animal body, before they are capable of being hatched. Eggs are hatched in the alimentary

*Presented at the sixty-second annual meeting of the American Veterinary Medical Association, Portland, Oregon, July 21-24, 1925.

tract, the parasite grows to maturity in the intestines, and there lays eggs which are passed out with the feces to the ground. The adult is free in the small intestines, gaining its sustenance by ingestion of the digested material. It is not a blood-sucker. The symptoms produced are varied, the most common being an enlarged abdomen, emaciation, anemic mucosae, ocular discharge, rough coat, fits, convulsions, irregular appetite, constipation or diarrhea, paralysis and chorea-like twitching, which passes away after the removal of the parasite.

Animals of any age may be infested, but the worms are more numerous and do more damage in young puppies, and in weak and aged animals, many litters of suckling puppies dying each year from their effects. Impaction sometimes occurs. Most animals harbor this parasite, and notwithstanding the many harmful effects that do occur from their presence, many animals harboring them, even in fairly large numbers, present no untoward clinical symptoms of their presence. Diagnosis is made from the clinical symptoms, the passing of worms in the feces or in vomited material, and by microscopical examination of the feces. Unless worms are known to be passed by the dog, the microscopical examination of the feces is the only positive method of diagnosis.

Treatment: Chenopodium is the most effective agent against roundworms, but it is too irritating for general use in small puppies, weak animals, or animals suffering from febrile diseases, or in an animal with a digestive tract already irritated to any degree. For animals in fair condition it is comparatively safe, and nearly always effective, in doses of fifteen minims for a thirty-pound dog, or at the rate of one-half minim per pound live weight. I never like to exceed fifteen or twenty minims in a dog of any size, although Winslow recommends as much as thirty minims for a twenty-two-pound dog. Personally I think that dose too high, for the drug is too irritating and also may cause deafness. Oil of chenopodium is fairly safe, in my opinion, if cases are selected properly. Always give a purgative with chenopodium, as expulsion of the agent is very important. We usually use castor oil, giving fifteen minims of oil of chenopodium with one ounce of castor oil, this being administered to a thirty-pound dog after fasting twenty-four hours. Often this can be followed safely and to advantage with one-half grain of arecolin hydrobromid, administered four hours later, thus decreasing the danger from the chenopodium, and also acting as a vermifuge.

It is very effective in removing ascarids, either in combination or alone.

Since the advent of carbon tetrachlorid, it has almost displaced chenopodium for general use with us. Carbon tetrachlorid being much less irritating, we use it in doses of from fifteen to forty-five minims in capsules, either alone or with castor oil, care being taken not to break the capsule in the mouth. This is followed by a purgative, using castor oil in ounce doses, or often by arecolin, in half-grain doses, administered four hours after the carbon tetrachlorid, especially if there are any indications of tapeworms. The writer believes the carbon tetrachlorid will be more effective when given without oil at the time of administration and followed several hours later by suitable purgatives. The combination of carbon tetrachlorid, followed in four hours by arecolin, is very effective against mixed infestations or most any combination of parasites, the carbon tetrachlorid killing roundworms and hookworms, and the arecolin acting as an ascarifuge and teniafuge. The above combination is very frequently used by us, as mixed infestations are so common in the South. The above has been found very satisfactory and safe where indicated.

Santonin A Useful Drug

Santonin is undoubtedly the drug of choice in suckling puppies and animals suffering from an irritated digestive tract. It is safe in therapeutic doses and not irritating. The following prescription is very effective in suckling puppies: santonin and calomel, of each, grain one-tenth; bicarbonate of soda, grains two. Give in a capsule at one dose after fasting the dog over-night. Repeat every third day until three doses have been given. The dose scale for larger animals is one-eighth grain per pound live weight, the maximum dose in any case never exceeding three grains. The calomel and soda are increased in corresponding proportions. The best results are obtained by giving divided doses, as in the above prescription.

The *Ascaris mystax* is the species which infests the cat. It produces symptoms similar to those described in the dog, although I do not believe it is as serious a menace to the cat as the *Ascaris* is to the dog. The best agent to use for removing this parasite from the cat is santonin in combination with calomel and soda, using for the cat one-half the dose given for the dog, the other

agents discussed being too irritating and nauseating for use in cats.

Hookworms

Ankylostomiasis: There are two species of hookworm that infest the dog, the most common being the *Ankylostoma canina*. The hookworm is very prevalent in the South. Nearly every case examined at Auburn lately has shown positive evidence of its presence, and we make a practice of making fecal examinations of most cases presented for treatment, regardless of the condition for which they are brought to us. Every black tongue case, and a good many distemper cases, examined at Auburn lately, have shown positive evidence of hookworm infestation, some being very heavily infested. Several of these cases were so badly infested that they were given carbon tetrachlorid in doses of from fifteen to thirty minims for average-size dogs, regardless of their condition. None of them evidenced any detrimental effect from its use. Others showing light infestations were treated, if in good condition, and some were carried over until the digestive tract was in better shape for treatment. I have come to the conclusion, however, that when animals show much hookworm infestation, the hookworms should be removed with carbon tetrachlorid, regardless of the condition of the patient. Carbon tetrachlorid, in our experience, when given in small doses, as above, is comparatively harmless. Our experience shows us that animals suffering from other diseases, complicated with hookworm infestation, have a better chance for recovery if treated for hookworms.

Hookworms Are Bloodsuckers

As we all know, the hookworm is a small parasite supplied with cephalic hooklets, by which it attaches itself to the mucosa of the small intestine, and sucks the blood of the host. These worms are truly bloodsuckers, which accounts largely for the great harm that they do. The hookworm of the dog, according to Underhill, gains entrance to the intestines in the embryo stage, where it hatches, grows to maturity, attached as above described to the mucosa of the small intestine, where eggs are deposited, becomes segmented very rapidly and then is passed to the ground, where it becomes encysted. Moist earth seems to be necessary for its development. Thus, insanitary, damp kennels favor its multiplication to a marked degree.

This disease of dogs is analogous to that of man, dochmiasis,

which is caused by the *Ankylostoma duodenale,* which is supposed to gain entrance to the human through larval migration, starting in the feet of the host, usually causing ground-itch. I merely mention this, as it might throw some light on the life history of the *Ankylostoma canina,* although I have never found a condition in dogs which simulates ground-itch in man, sufficient to account for the large percentage of cases in dogs found in the South. The hookworm develops very rapidly and infests all ages and classes of dogs, bird dogs confined to kennels probably being the most common victims. As in other parasitic invasions, weak animals seem to make a most favorable host.

The symptoms produced are those of marked emaciation; anemia, as shown by the paleness of mucosae and skin; diarrhea usually sets in, very fetid in character and often containing blood; edema sometimes occurs; also fits and convulsions. The appetite is usually ravenous but the patient, when heavily infested, in spite of the amount of food consumed, gradually loses weight, becoming in some instances almost a skeleton. The appetite at times may become diminished if severe complications intervene, as enteritis or pneumonia. The course of ankylostomiasis is usually chronic. Positive diagnosis is made by microscopical examination of the feces.

Treatment: Carbon tetrachlorid is by far the safest and most effective agent we have at our command and is the only one we need consider here. I use it in doses of from fifteen to forty-five minims, for a dog of thirty pounds or over, depending upon the condition of the patient. This agent, as we all know, was brought into prominence by Dr. Maurice C. Hall, who revolutionized hookworm treatment in both man and dog. Dr. Hall worked out the dose, giving one and one-half minims for each pound live weight. I have administered as much as two drams to a thirty-five pound dog with no ill effect, and many others have given much larger doses than that safely. However, when using such a potent agent, it behooves us to be a little cautious, for sometimes bad results will follow too large a dose. In weak animals I prefer to use about two-thirds of the maximum therapeutic dose.

Care Should Be Exercised

Care should be taken not to burst the capsule in the mouth and always to use a chemically pure product. Dr. Darling, of the Rockefeller Foundation, reports several deaths of natives of

a tropical island traceable to using an impure product. Necrosis of the liver was the principal lesion found. In cases of hookworm infestations in suckling puppies, we use one-half to two minims of carbon tetrachlorid, followed by a half-teaspoonful of castor oil in two hours. In giving carbon tetrachlorid, the patient should be fasted over-night and followed in four hours by a suitable purgative. Chenopodium and thymol are good agents, but much more dangerous and less effective than carbon tetrachlorid, so we have discarded them for use in hookworm treatment. Cats are rarely infested with hookworms and, if so, should be given one-half the dose of carbon tetrachlorid recommended for a dog. The writer has never found them in cats.

Teniasis

There are eight species of canine tapeworms and one that is specific for the cat. All the tapeworms are segmented and attach themselves to the mucosa of the small intestine by means of rows of hooklets on their rostellum. They are not blood-suckers, but merely attach themselves to maintain a firm position. Segments absorb the digested food of the host. They are hermaphroditic, each segment containing a complete reproductive system. When segments mature they come away, being passed out in the feces, afterwards finding their respective intermediate hosts. By far the most common species is the *Dipylidium caninum*, in fact the only one I have found occurring in large numbers. This is a small cucumber-seed-like parasite, hence the old name *Tenia cucumerina*. It ranges in length from six to sixteen inches, the most delicate of the dog tapeworms. Its intermediate host is the dog flea, which accounts for its frequent occurrence and in such large numbers, sometimes producing occlusion of the small intestine. The writer has found two other species in dogs, the *Tenia marginata*, which has its cysticercus stage in the peritoneum, less often in the pleura, of ruminants and hogs. (Name of cystic stage, *Cysticercus tenuicollis*.) The other is *Tenia serrata* (*pisiformis*), the cystic stage being the *Cysticercus pisiformis* found in the mesentery and omentum of rabbits. I am going to mention two other species, because they sometimes infest man. They are *Echinococcus granulosus* (cystic stage in liver and lungs of ruminants and hogs, also in man; adult stage in dog and man). The other, *Diphyllobothrium latum* (adult stage in man and dog, cystic stage in fish), is not a true dog tapeworm but sometimes infests dogs in fish countries. The

Dipylidium caninum sometimes infests children who play with dogs.

Symptoms: The symptoms are very similar to those produced by the *Ascaris*. The *Echinococcus granulosus* is said to produce more irritation than the others.

Treatment: There are many good agents used in treating tapeworm infestations, such as kamala, pumpkin seed, aspidium, kousso, areca nut and arecolin. We use arecolin hydrobromid in half-grain doses for thirty-pound dogs, repeating in thirty minutes, if necessary. It is usually unnecessary. This has been found very satisfactory, both from the standpoint of efficiency and safety. It generally acts in from fifteen to thirty minutes, and in a fairly drastic manner, the action lasting, as a rule, but a short time. Generally it has no tendency to bad after-effects. It sometimes produces vomiting, but is generally effective in spite of that fact. It can be given subcutaneously or intramuscularly in one-half the above doses. Cats are sometimes infested by *Tenia teniaformis* (cystic stage, *Cysticercus fasciolaris*), which inhabits the liver of rats. A cyst of this parasite was recently removed from the liver of a rat killed in the Auburn Hospital. The adult tapeworm was found in same rat's small intestine. Cats are more susceptible to arecolin shock than dogs. Consequently it is advisable to use some less drastic agent, as the decoction of pumpkin seed.

Whipworms

Trichuris depressiusculus: The whipworm of the dog is found in the cecum. This species is chracterized by the anterior three-fourths of the parasite being very long and slender. These parasites gain entrance into the alimentary tract through contaminated food and water, reaching there in the egg-stage. The parasites find their way to the cecum, where they remain throughout adult life. They often produce no apparent harm but frequently set up irritaion of the cecum, sometimes producing inflammation of that organ, causing a toxemia, which causes the animal to become unthrifty and emaciated, and producing symptoms somewhat similar to chronic inflammation of the intestines. Diarrhea is sometimes present and the feces may contain blood. A positive diagnosis can be made only by the use of the microscope. Due to the location of the worms, anthelmintics are usually ineffective. Very large doses of carbon tetrachlorid, chenopodium and santonin have been tried with

varying success. In heavy infestations, where much trouble results and from light infestations when severe toxic products are eliminated, I think the removal of the cecum in such cases would be justifiable, when a positive diagnosis can be made. However, we must bear in mind that the finding of eggs under a microscope does not always signify that the trouble from which the animal is suffering is due to the presence of parasites.

Rare Parasites

There are three other parasites that I will mention merely for the sake of calling attention to the fact that they are sometimes found but are, or at least have been with us, extremely rare. One is the *Spiroptera sanguinolenta*, found in nodules under the mucosa of the esophagus, the intermediate host being the cockroach. Another is the *Dirofilaria immitis*, found in the ventricles of the heart, in dogs. It has been my pleasure to find one case of each of these, both upon postmortem, in dogs dead of black tongue. The third, *Haemostrongylus vasorum*, belongs to the *Metastrongylus* or lungworm group. These are found in the pulmonary arteries of dogs. I have never found a single specimen of the last named.

Conclusion

In conclusion I wish to stress the importance of the microscopical examination of the feces before administering treatment, for in this way we will avoid unnecessary danger for treating animals not infested. Also we will know with what type of parasites we are dealing. Therefore, we can administer the anthelmintic suitable for the case in question. I also wish to call your attention to the value of postmortem work, as this often sheds much light upon the subject. I further want to stress the importance of the knowledge of life histories. This knowledge gives us the most effective agent of attack in controlling parasitisms.

Discussion

Dr. C. A. White: I think we have listened to a very well prepared paper, introducing the subject from the scientific and practical standpoints. It is a fact that individuals will disagree. However, in this paper, there is not very much to disagree with. The doctor told us of the cucumber tapeworm, one of the common tapeworms, but I did not hear him tell us anything about that favorite parasite that they have in the South, *Dirofilaria immitis*. That is one that we very seldom hear of. I am sure that he must have seen it, being from the South. Now, regarding the treatment for different parasites, of chenopodium and carbon tetrachlorid, my choice is chenopodium, but in this country, where we have so much heat, we have to be careful and not give too much. We all know that chenopodium is a cardiac depressant, unless it is combined with a heart stimulant.

In small puppies we have deaths, and I believe that in small puppies we lose more from the treatment than we do from the parasite itself, although quite frequently we get the parasites in very large quantities. The treatment I have pursued is small doses often repeated. Treat a puppy two months old with chenopodium every three days, using very small doses. Take the fox terrier. The average one will weigh about ten pounds. Give him two minims, with a stimulant during the hot weather. Give aromatic spirits of ammonia, combined with castor oil. I find that far better than giving one big dose. You do not, as a rule, get all the parasites, but you get a sufficient number to relieve him and if it is repeated in three days, in the course of three treatments we will eliminate all the parasites in the intestinal tract, including the tapeworm and the roundworm. Puppies at that age are not, as a rule, bothered with tapeworms but occasionally we find them.

In this country we do not find as many of the hookworms as in the South, I am sure, but we do find and have quite a lot of the tapeworm which infests the cecum and also the small intestine. The treatment I find best for that is to get them out of the cecum and I find that an injection of normal salt solution is as good a remedy as any, following that with chenopodium, not by the rectum but by the mouth.

I think the doctor has been a little heroic in his treatment with arecolin. Arecolin does rather good work, but to give a twenty-pound dog half a grain is inviting trouble, in my opinion; in a dog of twenty pounds a quarter of a grain subcutaneously is inviting death, in my opinion. In a horse we very seldom give more than half a grain subcutaneously. Why should a twenty-pound dog be given that amount, or a quarter of that?

Cats with intestinal parasites are very difficult to handle, because they will vomit and they do not take very kindly to medicinal treatment, but I prefer santonin and calomel in treating cats for tapeworms and for roundworms. We are told that santonin has no effect on the tenia. I have to disagree with out textbooks on that subject. I have had splendid results, and I give it in doses of one-tenth of a grain with calomel every two hours, just depending on the size and age of the animal; and kittens will take four-tenths of a grain with the best results. You may follow that with castor oil, but calomel, I think, is one of the most valuable medicinal remedies that we have, and the trouble, I think, is that we do not use enough of it. Police dogs take enormous doses and I do not hestiate in giving police dogs four grains and following it with castor oil, and with very good results.

The administration of the different medicinal remedies for worms should not be given, in my opinion, in one drastic dose, but should be given in small doses and repeated often.

I have a police dog I have had from the time he was six weeks old and every Sunday morning, just as regularly—I was going to say, as I go to church—I give a small dose of worm medicine and examine the fecal matter—not every week, but probably every two months, and I have failed to see any worms from the time that puppy was four months old, and he is still getting it, because in California we have intestinal parasites all the time. In fact, it is a continuous performance, and I recommend the mild treatment for the intestinal parasites every month during the summer months; in the winter months the intermediate hosts are not so prevalent, and we do not administer the medicine more often than every three months.

I would like to have the doctor tell us something about that *Dirofilaria immitis*, if he has had any experience with it. It is not a very long while ago that I had a dog, a young Dane, that was brought to the office with ascites; in fact, I did not make the diagnosis I should have. Probably, it was on account of lack of experience with that parasite. The postmortem revealed that the auriculo-ventricular opening was filled with the *Dirofilaria immitis*, and in the literature I am told it is quite prevalent in New Orleans and other parts of the South.

DR. PATTERSON: I did mention *Dirofilaria immitis* in the paper, but evidently Dr. White did not catch it. I have never found but one instance of *Dirofilaria immitis* in the South, and we have made sufficient study of the

parasites down there to have found them in our own section of the country had the parasite been very prevalent.

Just one other little point I want to make clear and that is about arecolin. Dr. White misunderstood the weight of the animal I had in mind. I said thirty pounds. One-half grain for a thirty-pound dog does seem an unreasonably large dose of arecolin. But we have found from actual experience, during the past three years, that it is one of the safest anthelmintics we have used when given by the mouth in half-grain doses to dogs weighing not less than thirty pounds, provided of course, the animal is not very weak. I agree with Dr. White that the doses ordinarily given for vermifuges by our text-books are in general too large.

DR. C. H. COLTON: There is one question I would like to ask with regard to the deafness following the use of chenopodium. I never saw anything of that until the JOURNAL mentioned it recently. I would like to hear from some doctor on that.

DR. PATTERSON: We have observed several cases caused by large doses of chenopodium. Carbon tetrachlorid is nearly as effective in roundworm infestation and less dangerous. We are using very little chenopodium at present. Personally, I have never had any bad effects from the use of chenopodium, but from cases observed that were treated by others I am convinced that it will cause deafness, and even death, if administered in too large doses or to patients suffering from irritation of the digestive tract.

DR. COLTON: Have you found it permanent or temporary?

DR. PATTERSON: It generally passes off, but in some cases it lasts a good while.

DR. F. H. MCNAIR: We have often brought about the elimination of tapeworms with the use of carbon tetrachlorid. Do you think it is due to the tenicide effect or the castor oil?

DR. PATTERSON: We have not had much success with carbon tetrachlorid as a tenicide. It may be that it removes some of them. One other point mentioned. We find a good many puppies two months of age infested with *Dipylidium caninum*.

DR. M. L. OLSEN: I would like to ask if this same treatment can be used in fox puppies. It seems necessary to worm fox puppies at a very young age—about four weeks—rather small and delicate.

DR. PATTERSON: I have never had any experience with fox puppies. I imagine the same general line of treatment, using reduced doses, would hold good in the treatment of fox puppies. The method we use is to secure a small specimen of feces from the puppies and make a microscopical examination to determine whether parasites are present and, if so, with what type we are dealing. Then we are better able to prescribe proper treatment. This eliminates the possibility of administering unnecessary drugs that might endanger the patient.

GRADUATE COURSES AT PENNSYLVANIA

The University of Pennsylvania School of Veterinary Medicine has announced the inauguration of graduate courses in veterinary medicine, open to veterinarians and physicians who are graduates of approved schools. Courses are offered in anatomy, physiology, pharmacology and therapeutics, pathology, bacteriology, surgery, obstetrics, diseases of small animals, medicine, meat hygiene, milk hygiene and animal industry. In addition to these courses, ample opportunity will be afforded to those who desire to take up problems in research. Students taking these special courses may elect to spend from one to four months studying problems in which they are especially interested.

ABDOMINAL SURGERY IN THE CANINE AND FELINE*

By Wm. M. Bell, *Nashville, Tenn.*

Abdominal surgery in the canine and feline is not resorted to, in many cases where it is justified, although it offers the only means of relief. In many cases, a positive diagnosis can be made where abdominal surgery is necessary, before opening the abdomen, but there are many cases where an exploratory opening becomes necessary to make a diagnosis. In that class of cases that can be diagnosed before opening the abdomen, we find, by careful palpation of the abdomen, an obstruction in the intestines, intussusception, calculi in the bladder, a uterus distended with pus, or a tumor of the ovary or mesentery. With the exception of the mesenteric tumors, these cases are all operated upon with entire satisfaction. I am not speaking of obstructions in the rectum, which can be removed with enemas or forceps, but those in front of the ileo-cecal valve. Following are some reports of such cases.

Case 1

Dachshund bitch; brought to the hospital; had refused to eat for several days; the little that she did eat was returned. Palpation revealed obstruction in the intestines. Gave general anesthetic and, after shaving and cleaning, opened the abdomen through the linea alba. Picked up the intestine with obstruction in front of ileo-cecal valve, opened the intestine and removed a large peach-pit. Closed the intestine with catgut suture, and abdomen with linen suture and metal clamps. The recovery was uneventful. Two years and a half later, I was fortunate enough to be able to hold an autopsy on this bitch. A very careful examination of the intestines failed to show the slightest sign that an operation had ever been done.

Case 2

Spitz dog; brought to the office for the rabies treatment, having been bitten by a rabid dog. We gave the fourteen-dose treatment. The dog refused to eat almost from the start, and when he left, at the end of fourteen days, he was very poor. I told the owner the trouble was due to the confinement and treatment, and that the dog would be better after he had been

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home a while. In a week, the owner called to say that the dog was getting weaker. I prescribed peptonized milk. A week later, the dog was brought back to the office. I prescribed extract of beef. A week later, I prescribed cod-liver oil. A week later, the owner brought him to be destroyed. For the first time, I examined the abdomen. The dog was so thin I at once felt an obstruction in the bowel. He was prepared and operated upon without delay. I took a bone out of the intestine, the organ being still vital. The wound closed, as in the former case. The patient required careful attention for several days, then he began to take food, and soon was in good condition. This case shows how we may be misled, on account of other conditions, and overlook a real one. This bone had been in this dog over six weeks when removed. Had the bone been very tightly lodged in the intestine, it would have destroyed the vitality of the part in less time, and death would have followed or, at the time of operating, an anastomosis would have been necessary, and that would have complicated matters. This case was early in 1924. We clipped him this year, and he was looking fine.

CASE 3

Fox terrier bitch; brought to the office, with history of "losing her water" whenever she would lie down. Examination by palpation revealed calculi in the bladder, too large to be removed except by opening the abdomen and bladder. The operation of human surgery, by going supra-pubic into the bladder without entering the abdominal cavity, I think, is impossible in the canine, at least it is for me. The patient was prepared under general anesthesia; the abdomen opened close to the pubis and the bladder opened near the neck, on the upper surface, and four stones removed; the bladder closed with catgut, and the abdomen with linen and metal clamps. Her recovery was uneventful. This operation was done four years ago, in 1921. I saw her in May, 1925.

CASE 4

Spitz bitch; brought to the hospital; she was small and very much emaciated, but with a distended abdomen. She had had pups about two months before; appetite was good and she looked bright; temperature normal. This case had some appearances of ascites, but on examination I decided it was not. She was prepared and the abdomen opened under general anesthesia. The uterus was greatly distended.

I removed the ovaries and uterus, ligated the ovarian arteries with catgut, and the neck of the cervix with catgut and, for about an inch back, with linen. I cut from the back or linen ligature forward, from above and below, so as to make a flap, and then removed the uterus and ovaries, suturing the flap with catgut, and the abdomen with linen, metal clamps and bandage. The uterus and contents (pus) weighed two pounds and nine ounces. A little more than one-fourth of the body weight had been removed. I never saw a case do better. On the sixth day, the bandage and the clamps were removed. The owner came and took her out of the cage, and she frisked about in great glee. An hour later, she had pulled the wound open, and the intestines were out and torn in two. I performed an anastomosis, but she died.

CASE 5

Male foxhound; brought to the office with what appeared to be a prolapsed rectum. It was readily reduced, but it was not a prolapsed rectum, but an intussusception. The dog was at once prepared for operation. An opening was made in the left flank. I found the cecum had inverted and passed through the ileo-cecal valve into the rectum. I soon found it could not be reduced, so did an anastomosis, removing the cecum and ileo-cecal valve, and attaching the colon to the small bowel, suturing it over a capsule with catgut, and closing the abdomen with linen and clamps. This case came to the hospital on June 25, 1925, and at this time (July 3) the stitches have been removed two days. The wound looks healthy, being almost entirely healed, and the patient is eating and having regular actions from the bowels. He will play and looks well. (July 14, or 19 days later, he is in good health.

CASE 6

Fox terrier bitch; brought to the hospital. History revealed that she had been sick a month and had been in two hospitals, where she had been treated for various troubles. Our diagnosis was intestinal obstruction, and we prepared the patient and opened the abdomen. The bladder was adhered to the intestine at the junction of the cecum, which was practically missing. I broke down the adhesions, but had to use the knife most of the time, as the adhesions were very strong. The intestine, for about three inches, was obliterated and had to be removed. Then we had a very large intestine to attach to a very small

one by suturing a part of it. Then I made the connection and closed the abdomen with linen, clamps and bandage. We then gave two ounces of normal salt solution intravenously and repeated it in six hours. The next morning she was dead. Too much blood had been lost in the operation.

Operative Conditions

Of the conditions for which one must open the abdomen for diagnostic purposes, ascites, jaundice and intussusception are among the most important. The organs that are involved in ascites are several, and while we have had little success in operating, there is one thing sure—our successful cases, without operating (in old dogs), are few and far between.

In opening the abdomen in a case of ascites, after drawing off the fluid, I have found a tumor in the mesentery, an infected uterus, and a hydatid liver. In the case of the uterus, it is easily removed. The tumors in the mesentery, I have tried to remove several times, but without success, as the intestines are so interwoven as to make it necessary to remove a section of the bowel, and as the vitality is so low, I have never had any success beyond the satisfaction of knowing that I did my best. In operating upon a case of ascites, where a large amount of fluid has been removed, and then the cause removed, I think it very important that there be three or four ounces of normal salt solution put in the vein, every twelve hours for the first twenty-four hours (three injections), and the patient kept where it is quite warm.

In operating in cases of jaundice, I look for gall-stones in the gall-bladder and duct (which I have never found). If the gall-bladder is empty, there is nothing in the duct, and if there is no abscess in the liver, I close the abdomen. It is my intention to do some more operating along this line as soon as I have the opportunity. I shall try to catheterize the gall-bladder by opening the abdomen and puncturing the intestine opposite the opening of the duct into the intestine. I shall try passing the catheter through the mouth and manipulating it through the opening in the abdomen.

Technic

Cleaning: Wash, shave, dry and paint with tincture of iodin.

Anesthetic: A. E. C. in a dropping-bottle.

Inhaler: A cloth bag with a draw-strong to go around the

patient's neck. A piece of domestic to cover the patient, with a slit in it, through which to operate. This cloth is boiled with the intruments.

Assistance: A person to administer the anesthetic and an assistant. One person can not operate successfully and humanely. Two can not in all cases. Three can, but four are better. In a serious operation, we have five, four in the operation and one to answer the phone and attend the office.

The abdomen is opened at the selected place and the contents carefully examined for abnormalities. When one is found, it is brought to the outside and carefully examined, and the operation decided upon. In doing an anastomosis, an assistant with clean hands holds the intestine to keep it from leaking, and holds it in the best position for the operator, both his thumbs under the intestine. So far as possible, the hemorrhage is controlled before it is started. A little loss of blood in a weak patient may prove fatal. In many of these patients, they have not a drop to waste. Every time we operate, we try to do better than we did before.

Discussion

Dr. O. A. Longley: Please describe the stitch used on the abdominal wall —on the intestinal wall.

Dr. Bell: We pick up the intestines, the mesentery hanging below. In taking out a section of the intestine, if the mesentery is not diseased in any way, no part of it is removed. If there is a tumor in the mesentery, or in the intestine and extending into the mesentery, we have to take out a section and put the mesentery together with a continuous suture. We do not do that often. We do not bother the mesentery if we can help it. We take the intestine out, down to the mesentery. Take one part out and strip it well back. Get all the fecal matter out of the way. Cut the intestine with a pair of scissors and cut the mesentery close to the piece of bowel to be removed. The assistant holds one end while the other is being prepared. Get the ends in apposition, holding them back far enough to make the stitching handy. Stitch through the wall of the intestine, just above the mesentery, and pass the suture back through, just above the mesentery and a little ways back from the other end of the intestine, using a pair of artery-forceps to hold the ends of the suture. Dry the end of the intestine with good, long, staple cotton, so as to have no lint. If we use a capsule, the intestine must be very dry, or the capsule will dissolve before the intestine is sutured; the capsule will collapse if you do not have the inside of the intestine dry.

Chairman Emmer: Dr. Kingman is not present. Dr. Patterson, will you give us a few remarks on this paper?

Dr. E. E. Patterson: I surely enjoyed Dr. Bell's excellent paper very much, and I think the other gentlemen here have, too. I was not prepared to discuss this paper. I was quietly taking the matter in, all by myself, and letting it soak in. Some of Dr. Bell's work is unique. One particular piece of abdominal surgery that he speaks of appealed to me very much, and that was where he found pus in the uterus. In our work, we do not do that kind of surgery. We find that the majority of pyometra cases are in old bitches. We simply open up the abdominal cavity—I am speaking now of pyometra—and instead of removing the uterus and the ovaries, we simply palpate the corpus luteum, do as little as possible to it, sew up the abdominal incision, and in a day or two that pus will all pass away through the vagina. Then

we wash out with Lugol's solution. I found, after doing many of these operations, that our success was small where we removed the uterus, so we quit doing it, but by manipulating the corpus luteum, we had better success, and these cases invariably recovered.

Now, relative to the A. E. C. mixture. I have tried many anesthetics, but I get better results from the A. C. E. mixture than I do from any others.

DR. C. H. COLTON: Do you ever use the Murphy button?

DR. BELL: At one time, I used the Murphy button; but really I can get along much better without it. I have had more success without it. We have some Murphy buttons in the case at home, but never use them.

DR. R. A. BUTTON: In the operation of taking off the large bowel and attaching it to the small bowel, do you have to reduce the bowel where you do not use the lateral anastomosis?

DR. BELL: We reduce the large bowel by turning it in, directly opposite to where it attaches to the mesentery, reducing it to the size we want and stitching the serous surfaces together. We then unite the ends of the bowel with a Lembert suture, bringing the serous surfaces together. I said I have not had good success with the Murphy button and rather poor success without it, in making a lateral anastomosis. In the end-to-end union there is also, of course, a chance that the big bowel will eat up the little one (intussusception), but I have not had any trouble of that kind.

DR. S. H. MCNAIR: I think Dr. Bell's paper is outstanding and in some respects some of his views admittedly right. I would like to ask several questions: First, whether or not, in some of his obscure cases, where he can not make an accurate diagnosis, he employed an abdominal exploratory operation with good success? Personally, I have had several such. I strip the entire intestinal contents with my fingers and generally find any obstruction, and the patient, having wasted away very seriously through a several-weeks period, immediately begins to recover.

Dr. Bell speaks of an intravenous injection of normal salt solution. I would like to ask what vein he picks up.

I think that our men in the San Francisco section, while we do use the A. C. E. mixture, almost invariably give moderate doses of morphin, or H. M. C. in conjunction.

DR. BELL: In answer to the first question, of course, we open the abdomen, and in cases where we do not find anything, we go through the bowel from end to end without making any discovery, that is true. But, in these cases of ascites, we have had rather poor success, although we have saved some. Not long ago, we took out a uterus that was covered with watery blisters from end to end; after taking it out and opening it, it showed deposits through it and the animal got well. Most cases of ascites die. Take a dog with ascites. He has had such a drain on his system that when you take out a gallon of fluid, he is bloodless, as a rule, and then when you remove the organ that is affected, if this is possible, the animal is so depleted that it will die.

Sometimes I have thought it advisable to leave a quantity of the fluid in the abdomen and not let it all get away. That, perhaps, might keep him up much better. The vein that we use, in answer to your question, is in either the front or the hind leg. Near the ankle, the vein stands out clearly. We shave the hair off and use a glass syringe. Put a little pressure on the vein, to raise it up, and inject just a little to show that you are in the vein. If you are not, you can easily tell, as it will swell up on one side or the other.

Now, the last question. We give a dose of camphorated oil, to a weak animal, before giving the anesthetic and, in place of using A. C. E., we use A. E. C. (one part alcohol, two parts ether and three parts chloroform). I would say that we do not lose one dog in two hundred, from the anesthetic. We use the same anesthetic for cats.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

SYMPTOMS AND TREATMENT OF THE DIFFERENT FORMS OF CANINE DISTEMPER*

By G. W. Closson, *Hollywood, Calif.*

Some writers have made four classifications of distemper: respiratory, intestinal, nervous and exanthematous. I really think that, if classification is to be made, there are only two classifications: respiratory and intestinal. The nervous and exanthematous types are only two of the many after-effects or complications of respiratory or intestinal distemper. One may see all of these conditions in one animal, to a greater or lesser degree.

Possibly a better classification would be complicated and uncomplicated distemper. Dogs very rarely, if ever, die from uncomplicated distemper, the symptoms of which frequently are vague. Even a close-observing owner or caretaker will never think of distemper. In fact, they are more liable to want to think it is not distemper. They think of worms, overfeeding, indigestion or anything but distemper. They may give worm medicine, the shock of which may precipitate a well-defined case of distemper in a few days. It has been brought to my attention, where puppies of the same litter were similarly affected and one had been given worm medicine, that in two or three days the puppy so treated had a well-defined case of distemper. I do not say that the worm medicine caused the distemper, but it helped to weaken the vitality so that the puppy could not combat the distemper infection, which was already there. Another puppy, in apparently the same condition as puppy number one, did not get any worm medicine and went on to a fine recovery in a very short time. Another puppy finally developed a severe case of complicated distemper and apparently started the same as the other two. Puppy number two was the only one of the three that did not have complicated distemper.

The symptoms of uncomplicated distemper, as I have stated before, are rather vague and may be misleading. There may be fever for a day or so, and the owner describes the animal as being off his feed. Possibly that is all that is noticed. He seems

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a little lazy or indisposed, as it were, then snaps out of it and makes a fine recovery.

One condition that may be cited at this time is the teeth, or "distemper teeth" as they are sometimes called. As you all know, it is an erosion of the teeth, in which the enamel softens and comes off. Some veterinarians claim that this condition is due to rickets and not distemper, but I have failed ever to see a dog have distemper after the teeth were so affected. Many of these dogs have had mild cases of distemper, which, at the time they were sick, would have been called uncomplicated distemper though they may have been complicated with rickets. But, in my mind, I think distemper has a great influence on this condition of the teeth.

Complications in Distemper

The complications in distemper are many. Of the respiratory tract, we have laryngitis, pharyngitis, bronchitis, pneumonia and pleurisy. We also find inflammation and ulceration of the cornea, ophthalmia, cataract, chorea, paralysis, spasms, fits, deafness, etc., when the infection has been either respiratory or intestinal or both.

We find gastritis, enteritis, gastro-enteritis, icterus, nephritis, cystitis, epileptiform spasms and chorea when the infection is entirely intestinal. An exanthema is more often present as an intestinal complication. It is my opinion that all dogs are carriers of distemper, which may be latent, or have some predisposing cause for loss of vitality and resistance, such as worms, teething, exhaustion, shock from auto accidents or operation, poor feeding, or any number of things. Young dogs will get distemper from infected dogs, when in a receptive condition, and others may not.

I have known instances where whole litters have been left together, some had distemper and the others never showed the least sign of it, eating, sleeping, drinking, living, in every sense of the word, in constant contact with infected puppies.

Symptoms: The odor is one thing not to be forgotten. It is hardly a symptom, but it aids materially in diagnosis. Some writer, I think Mark Steffen, in his story, "The Itinerant Veterinarian," mentioned an old quack that made a great many of his diagnoses with his nose, and I know that my nose has helped me to diagnose distemper when other symptoms were confusing.

The temperature varies considerably, from 102° F. up, and

I really believe the temperatures that are up are more often found in uncomplicated distemper, because a great many of these will make a quick recovery, and I feel that, when an animal comes to my hospital, or I am called to see him, and I find a temperature of 104° F., that animal will be decidedly better in a short time. If he is not, his temperature drops to about 102° F. and stays there. This may be considered the acute form and it also may be the uncomplicated form.

The acute and chronic may be a better classification than complicated and uncomplicated. With the chronic condition, I find complications; when acute, I do not. I have drifted from symptoms, back to complications, so I will drift back to symptoms. The symptoms of uncomplicated distemper are a simple catarrh of the mucous membranes, a rise in temperature, and, as I said before, the animal appears indisposed. In complicated distemper there is a wide variation in the symptoms, depending on the complication: dry crusty nose, loss of appetite, languor, drowsiness, tendency to hunt warm places, shivering, sneezing, diarrhea, sometimes bloody, hard stary coat, dirty skin, dandruff, exanthema, etc. First a slight, watery discharge from the nose and eyes, which later becomes thick and gummy; increased diarrhea; great emaciation and finally epileptiform spasms.

We may also find bronchitis or pneumonia, with labored breathing; extreme soreness along the ribs and tucked appearance in the flank; coughing and evincing considerable pain and weakness, and rapid pulse and respiration. Upon auscultation, râles will be noticed. The animal has an elevated temperature and wants to sit most of the time, very seldom lying down or for only a minute, and then he is very uncomfortable. When recovery is not probable, a bad odor of the breath will be noticed. The patient blows out the cheeks and finally dies with gangrene of the lungs. Pleurisy does not appear often. The dog does not want to move, lies quietly and appears quite stiff. On auscultation we find considerable friction noise, as though two pieces of paper were being rubbed together.

Gastro-intestinal form: Loss of appetite; vomiting, thin putrid substance at first, later a rather dirty yellow color; excitement. Giving medicine very often will start vomiting. There is considerable thirst. After drinking large quantities of water, vomiting will take place. In the beginning there will be some constipation, which does not last long, and this is succeeded by diarrhea, which very often becomes bloody and may be almost pure blood.

Continued diarrhea finally may cause rectal prolapse. There is considerable abdominal soreness, sometimes there is rapid emaciation from the beginning, other times the emaciation is slower, finally terminating in epileptiform spasms. Sometimes epileptiform spasms will be the first symptoms noticed. Other times what we call "fright" disease or fits will be noticed, and in a few days a fine case of distemper develops.

Chorea

Chorea is involuntary jerking or twitching of the muscles. It generally manifests itself during convalescence, sometimes during the progress of the disease, or may develop two months after the animal has gone home apparently well. I think some lesion or congestion will be found along the spinal cord or its coverings when chorea is present, while in the epileptiform spasms the same condition exists in the brain or its coverings, one being spinal meningitis, the other cerebral meningitis. Chorea affects a group of muscles, sometimes of the head and neck, other times a front leg or a hind leg, rarely both legs, although one whole side is very often affected. I recall one case where the tongue alone was affected.

Almost every case of chorea can be traced to distemper within two or two and one-half months previously, possibly an uncomplicated form at the time. I have seen animals with chorea that the owner said had not had distemper, but when closely questioned, I would find that within the last two months there were a few days when the dog did not seem very well, but the owner did not think anything of it. Probably that was when the dog had distemper. An exanthema, a secondary condition or complication, sometimes called fever blisters, is present in the form of small blisters or pustules, generally observed on the abdomen first. It may spread over almost the entire body. The pustules or blisters break and a crust forms, which comes off, leaving white patches and, as they get better, a scaly condition or dandruff exists. This condition is most often found in gastro-intestinal distemper and occasionally with respiratory distemper, particularly if the bronchi or lungs are affected. An exanthema is generally present during convalescence or after the high temperature has subsided.

Treatment

I hardly think it necessary to go into the symptoms of all the complications of distemper, so will proceed to treat a few. It is

going to be hard for me to tell from what I get the best results. I have given Fowler's solution, sodium cacodylate and iron cacodylate. I have pushed pills, such as bitter tonic, intestinal antiseptic, Upjohn's tonic for children and triple arsenates; anti-distemper serum and bacterin, anti-hog cholera serum, 606 and normal horse serum. I have also tried diet and nursing, all of these, with good and bad results, or rather no results. I forgot to mention Chamberlain's cough medicine and Chamberlain's diarrhea medicine, with the same results, but I do believe I have had very good results from coryza tablets which contain acetanilid, quinin sulphate, caffein and camphor; also tonic for children No. 2, which contains iron, quinin, arsenous acid and strychnin. These are practically the same as the triple arsenate tablets, but the amount of strychnin is much smaller. I use the triple arsenates for large dogs.

The syrup of hypophosphites is a good remedy, but be careful. I had a sad experience, just at this place in the writing of my paper. A Boston puppy with distemper got about one-half teaspoonful of syrup of hypophosphites on an empty stomach, and before long was in the throes of strychnin poisoning. Fowler's solution, in graduated doses, and wine of cod-liver oil extract, which contains cod-liver oil and hypophosphites of calcium, sodium, potassium and iron, are very good. I have used serum and bacterin with good results in some cases, but after giving about four injections, if there is no improvement, you might just as well stop.

Warm salt water enemas or white of egg, turpentine and warm water makes a very satisfactory enema, which I find is healing to the bowel, and I use it a great many times. Nursing, keeping the patient as clean as possible, and keeping him quiet are big factors. If we could put our patients to bed and keep them there, it would be very beneficial. Raw eggs and whiskey, if you can get the owner to give it to his dog, are also good. Egg and milk, buttermilk, raw meat and malted milk are good foods. Barley water or rice gruel is also beneficial. Always keep the mouth clean. In lung complications antiphlogistine poultices or hot camphorated oil, applied to the chest and covered with a woolen coat or blanket, and an inhalant in a vaselin base applied to the nose clears the head and makes breathing easier.

It is hardly worth while to attempt to treat chorea and paralysis.

Discussion

Dr. E. E. Patterson: Dr. Closson's paper on distemper has covered the field, in my estimation, very nicely. As we all know, we have various forms of distemper, and climatic conditions, in my estimation, play a great and beneficial part in the relief of distemper and the curing of it. I find that distemper cases that are taken into the hospital, especially the German police dogs, do not respond to the treatment for distemper as well as other breeds of dogs. It is our plan, when a case of distemper comes into the hospital, to advise the client to take the dog home and treat him at home and get him out in the air. As I say, I think that the air and the climate have a lot to do with the recovery of distemper patients.

For instance, we will take a police dog, and no doubt you are all aware, as I am, of the fact that the police or German shepherd is one of the hardest dogs that we have to treat. It appears that they do not possess any immunity. In our city we have an importer of German police dogs and he invariably imports about a hundred every year. Last year he had a number of bitches whelping. His kennels were out in the country and in one litter he had eleven puppies. They all grew to about four months of age, when they were taken down with distemper. He sent one in to the hospital and I prescribed for him. He wanted to bring them all in and I suggested not to do so, but to treat them out there. We fixed up a place for the puppies and isolated them and every one of the puppies came through nicely. Shortly afterward he came in with some other puppies, a little older, three of them, and he left them in the hospital and wanted me to treat them, and I advised him to take them back to his place, but he said not. The result was that we treated those three puppies and we had them there about four weeks and we lost them all. Now, I claim that the outside air is very much more beneficial for the treating of distemper than it is to house them.

The mongrel dogs that come into the hospital, I believe, respond to treatment much more readily than the finely bred dogs. The bulldog and the Airedale seem to respond to treatment a little better than the other types or breeds of dog.

The feeding of distempered dogs is a very important thing, also. I did not take up this in the discussion of Dr. Brown's paper because I thought it would come out in treating distemper. Some veterinarians advise giving meat to distempered dogs. Now, in the first place, I think that that is very bad practice. A dog's stomach, when he is down with distemper, apparently lies dormant, does not have any action whatsoever, and the giving of meat is not the thing to do. I think all distempered dogs, when they are first coming down with the disease, should be fed on an easily digested diet, of milk, broth, eggs, and not too much, but fed often. They shoud be fed every two or three hours, and I do not believe that they should have any water at all. I do not think that water in a dog's stomach, when he is sick, is of any value, and I think it does a lot of harm.

Dr. J. F. Hemphill: I would like to ask the doctor if he has found more difficulty in treating the greyhound with distemper than other breeds. Also, there has been so much difference of opinion as to the diets spoken of here, I wonder if there is not something in the altitude and the atmospheric conditions and the like, in our different localities, that has something to do with the kind of food that the growing puppies and the sick ones should have.

Dr. G. A. Jones: I would like to ask Dr. Closson, or any other canine practitioner here, if he has ever seen purpura hemorrhagica in any of the dogs that he has treated. I had a case that I am satisfied had it, as it showed all those symptoms—swellings, ecchymoses, and hemorrhages.

Dr. W. H. Kelly: I was in a similar predicament. I had a case which I could not diagnose, as any other than purpura hemorrhagica. The distemper seemed to be more severe, it did not seem to yield to any treatment, and, as the doctor says, none of the German police dogs seem to recover. It seems to be more severe this year.

Dr. B. D. Kennedy: I would like to ask Dr. Closson what is his treatment for chorea and I would also like to ask him to define this odor that he detects on the dogs.

DR. F. H. MCNAIR: I would like to ask Dr. Closson if he has made up his mind on the question of the age limit in distemper. Personally, I have seen definite cases of distemper in ten- and twelve-year-old dogs. Also as to the percentage of dogs which have the second definite attack of distemper. Also the prevalence of the rash in distemper. I have an assistant who has made quite a study of distemper rash and some time ago he came to the conclusion that all cases of distemper showed the rash; some cases show nothing else. Now, this rash may be very light, but if it is closely watched, it can always be found, is his contention, and he has verified it in a number of cases.

A number of times we have refused spaying cases on the strength of a rash and the dog definitely showed the other symptoms of distemper a week or two later. Also, he has found endocarditis in many cases of distemper. I know I have slipped on this point myself, and I am wondering if other men have. I had a case of pneumonia diagnosed when I really had either a bad case of endocarditis or septicemia. I think it is rather difficult for most men to become expert at auscultation on the dog, because of the hair. He spoke of "fright disease." I rather took it that he is of the opinion that fright disease is one of the symptoms of distemper. Around San Francisco Bay there is quite a difference of opinion on the question of fright disease.

DR. CLOSSON: I do not know that I got all these questions or not. The climatic condition, I think, possibly has something to do with it, although with us our climate is so similar the year round, except in a day we will have four different climates, and we find that if we can keep our dogs warm we do much better with them. We bring ours in about four o'clock in the afternoon, as soon as the ocean breeze commences to come in. If the day is warm, we most always put them out for a little while, but still they are too apt to move around.

As I said in my paper, I think if we could put our patients in bed and keep them there, they would do much better than if they were allowed too much liberty; and as far as taking them home is concerned, I find that the owner is prone to do too much, or maybe he gets up and stirs around and sees if they will do things, where if he would keep them quiet they would do much better. I have found that we can do that in the hospital, where we can not do it in the home.

In answering Dr. Jones' question, I have not noticed that condition at all. I think we have at times more virulence than others, although I think that Southern California has the reputation of being one of the most virulent fields for distemper.

As for a remedy for chorea, I never have discovered anything that will do them any good. I find that some of them will respond to arsenic; and the odor reminds me of being down East a little way. I asked a man to tell me where we would find Main Street. "Well," he says, "there ain't a man in town can tell you how to find it, the only thing we can do is to get in your car and go with you and show you," and the only way I can describe the odor of distemper is to take you some place and let you find out for yourselves. I do not think you will ever forget that odor.

The age limit. I find that most of our losses and most of our distemper is in young dogs from three to seven months old, and as they get older, from seven months on, we have fewer cases for possibly a year and a half or two years. We do not have very many older cases, although I have seen a few cases in dogs four years old, and I do not recall any time when dogs have had a second attack of distemper.

The rash is not always present. I think we have a very similar rash due to a dietetic condition or possibly due to worms, and still we do have a rash quite frequently and, at times, as I said in my paper, the pustules would help in the diagnosis when everything else is vague, but still I think, at the same time, there have been other symptoms, possibly a rising temperature, or maybe just off feed, for a day or two.

I keep my hospital or distemper ward at about sixty, if it is possible, in the winter time. Of course, in the warm weather, we can not regulate that.

DR. MCNAIR: Mr. Chairman, I do not want to seem obnoxious, but it seems to me that this statement of withholding water from the distempered

dog harks back to the days when they withheld water from human fever patients. How are you going to supply Nature's demand for moisture if it is not with water? True, if a dog has a severe case of gastritis with his distemper, he may not be able to keep the water down, but he can at least lick ice, and it satisfies Nature's craving.

A VOICE: I wish to state that water is very detrimental to distempered dogs. In place of water, we substitute milk, either sweet or sour, cold, a little at a time and often.

DR. MCNAIR: I have found that milk will induce gastritis in distempered dogs.

DR. J. C. FLYNN: I think one of the most profitable things that I could say in regard to this paper is that it is one of the best-prepared papers that I have listened to for a long time. I heard a man make a remark, just a few days ago, a man who has had wide experience at veterinary meetings and a pretty good judge of men, and he said, "You can always tell when a man talks from his finger-tips, he has had the experience." Dr. Closson, you can tell, has had the practical experience and he has given it to you.

Now, I could differ a little with Dr. Closson in some respects. I think Dr. Closson mentioned that he believed that after the fourth dose of serum—I do not wish to misquote you, doctor—it was useless to give any more. I believe that you can still raise the resistance of the patient by giving more than four doses. I would agree with the doctor that four doses, and even three doses in many cases, will produce results. I have experimented a good deal, and I have found that six doses are not indicated in many cases, and I have found that I get my best results along at the time the animal has received the benefit of his third and fourth treatments.

The doctor stated that in possibly no case was it indicated to give more than four doses. I would give at least six doses of serum in most cases.

I agree with the doctor on the sixty-degree temperature of the room. I believe a warm room is detrimental in distemper cases, and particularly is it detrimental to change the temperature of your room and have it cold and then hot. We will take, for instance, in our contagious ward, a bright, nice, sunshiny day will come along, and every animal in the ward is doing nicely, and there will come up a thunderstorm and clouds and chilly temperature and the next day the majority of our patients are off their feed and the death rate runs up. I know that this is a subject that would take a long time to discuss, and it is a subject that most veterinarians are deeply interested in, but I do not believe that it is advisable to take any further time. I wish I could talk on it, I could talk on it for two hours without any trouble at all, and would be glad to do it, but I believe there are some very important papers following and we are crowded for time.

DR. O. A. LONGLEY: As far as vaccination is concerned the important thing to do is to give a dose of serum with the first dose of vaccine. You get immediate immunity, thereby, also lessening the reaction from the vaccine. Some veterinarians are using a fairly good-sized dose of vaccine with the serum; others are following the injection of serum with one or two doses of vaccine, and they get far better results than by using vaccine alone.

In a press report of a conference held at Purdue University, at which Dean Skinner, of Purdue, and Dean Giltner, of Michigan State College, were speakers, the following rather misleading heading was used:

"Indiana Veterinarians Hear Giltner, Skinner."

No offense intended, none taken.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

PRACTICAL FEEDS AND FEEDING OF THE CANINE AND FELINE*

By H. W. BROWN

Portland, Oregon

The subject of feeds and feeding of small animals, first assigned to me, incorporated so many different methods of feeding and included so many different species of animals, with such a variety of feeds, that I found it next to impossible to prepare a paper covering it. As you all know, the canine and feline constitute ninety-five per cent of the patients in the small-animal hospitals, therefore, with the consent of our Secretary, Dr. Flynn, the subject of this paper was changed to "Practical Feeds and Feeding of the Canine and Feline," which, covered in a general way, may prove of some benefit to the practitioner, even those of you in general practice who find yourselves called upon to treat these patients more often now than in the past. It is to be regretted that dietetics has not as yet been given the necessary consideration to enable one to obtain any great amount of authentic data on the care and treatment of the dog and cat.

In a paper of this nature, which is designed to point out some practical methods in caring for the dog and cat as they exist in their present high state of perfection, we as veterinarians are not particularly interested in their origin, which dates back into the centuries, except to know that they have always been numbered among the Carnivora, and that under domestication they have in many instances become omnivorous. Their entire physiological and anatomical structures have undergone very little change; hence, the basis of their diet should be meat. Granting this, domestication has so changed their natural way of living and limited the amount of exercise that it becomes necessary to prevent the system from becoming overloaded with impurities. This can best be accomplished by giving sufficient meat to provide for the protein requirements of the system and by adding enough cereals and vegetables to make sufficient bulk.

In the selection of food for the general diet, there are several factors to be taken into consideration: first, the cost; second,

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the convenience of preparation, dependent upon the amount of help always present without additional expense; and, third, the palatability, which is very important, since by giving a diet which tends to stimulate the appetite the patients may be kept in good condition in the hospital over quite a long period of time.

In conducting a small-animal hospital, regularity of feeding is very important. The routine can best be arranged if a regular time is set apart for feeding, and the animals do better. They are noisy at feeding time, but if fed at a regular hour each day, much of this may be eliminated, as the patients, if in the hospital for any length of time, soon learn the feeding-hour and are not disturbed at other times when some one happens to pass through the ward.

Pans For Feed and Water

Proper feed-pans should be of uniform size, about six to eight inches in diameter, and four or five inches in depth; thus making them more convenient to handle and rack when not in use. They should be smooth, for convenience in cleaning, and composed of a non-breakable material. There are some patent feed-pans on the market which can be recommended as meeting these requirements, and they have the added feature of being so constructed as not to be overturned easily. The price of these is the only objectionable feature. The same may be said of the water-pans, except that they should differ in some respect from the feed-pans, to prevent confusion when feeding.

The feed- and water-pans should be so placed in the kennel that they are not overturned by the opening of kennel doors or filled with the material used for bedding. The water-pans should be cleaned once each day and the feed-pans thoroughly cleansed after each feeding. This can best be accomplished by washing with soap and water, rinse, and then boil for twenty minutes. Once each week, they should be thoroughly scoured with a good powder before being boiled. Strong disinfectants should not be used in cleaning the pans, as it often requires more work to remove the odor of the disinfectant than to clean the vessel. If any odor is left, it is even more pronounced when steaming food is placed in the pan, and the patient will refuse to eat or drink because of it.

Now, we will take up the general hospital diet, and by this term I mean the diet which is given to all patients in the hos-

pital, except those that require a special diet. As stated before, the basis of the diet should be meat, the selection of which is governed principally by considering the source and cost. The cheaper cuts of beef and mutton are considered best, but hearts, liver and lights, from either hogs, sheep or cattle, may be used, but only those which are fit for human consumption. Horse meat is used by some, but is not to be recommended for a steady diet, because the patients soon grow tired of it. Liver is not so nutritious but is of special value in small portions mixed in the general diet, as it adds flavor and stimulates the appetite.

In selecting vegetables, source and cost are again considered. Green or dehydrated vegetables, including beans, peas, lentils, corn, carrots, lettuce, cabbage and spinach may be used. Cereals may be supplied in the form of stale bread, crackers, and bread baked from meals composed of four parts corn meal, three parts oat meal, and two parts bran, by measure.

Preparing the Diet

In preparation of the general diet, the most practical way to prepare the meat is to boil it, together with the vegetables, in a covered vessel, with sufficient water to cover, adding salt sufficient for flavoring. Cook until well done, then run through a meat grinder. In preparing the cereals, if stale bread is used, it should be cut and dried thoroughly for from twelve to twenty-four hours before being used. Whatever the cereal used, it should be ground. Meat, vegetables and cereals should then be combined in the proportion of one-half meat, one-fourth vegetable and one-fourth cereal, thoroughly mixed, and the broth, in which the meat and vegetables have been boiled, poured over the mixture in sufficient quantity to moisten it but not to make it sloppy. The portion should be made out according to weight, and served warm.

The following table may be used to determine the amount given each twenty-four hours:

Dogs weighing from 80 to 100 lbs.—2½ to 3 lbs.
Dogs weighing from 50 to 80 lbs.—1½ to 2½ lbs.
Dogs weighing from 20 to 50 lbs.—1 to 2 lbs.
Dogs weighing from 10 to 20 lbs.—½ to 1 lb.
Dogs weighing from 10 lbs. or less—⅛ to ¼ lb.

This diet should be replaced, once each week, with a diet of ground, raw, lean beef, and, in addition to this, large bones with

a small portion of meat on them should be given the dogs to chew on.

The general diet as given will suffice also for the cat, proportioned according to weight, as given small dogs, except that, in addition to this, a liberal quantity of whole milk should be given once a day. Once a day is considered sufficient to feed general-diet patients.

Under the heading of special diet are included: puppies, kittens, operative cases, convalescents and all patients that are not physically able to assimilate the general diet.

No definite rule can be given for the feeding of puppies. However, the preparation for the general diet may be given with a more liberal amount of broth, and the amount for twenty-four hours given in from three to six feedings, depending on weight, age and breed. Buttermilk constitutes a very wholesome variety of food for puppies and may be substituted for the general diet occasionally. In addition to the regular food, they should be given large, hard bones with just enough meat on them, either raw or cooked, to provide some nourishment, but mainly to provide amusement for them between feedings, thus eliminating much noise in the hospital. Also, it has proved a benefit in teething.

Kittens may be fed the same, but it should be given in smaller portions, as kittens are usually very dainty eaters. Liberal quantities of whole milk also should be given.

All food should be withheld from pre-operatives for a period of twenty-four hours. Post-operatives, convalescents and patients with severe digestive disorders should be given raw eggs, finely ground, raw, lean beef, concentrated meat broths and beef extracts, the amount and the regularity of feeding to be governed by the condition of the patient. This constitutes a diet of less bulk and is more easily assimilated.

Special Diets For Cats

Taking up special diets for cats—and they often include more than half the patients—we must take into consideration, as mentioned before, that they are very dainty eaters, often refusing almost any food offered, due to change of surroundings. However, this condition can sometimes be remedied by giving the same variety of food they have been fed before entering the hospital. Even then, several changes are often required to prevent a hunger strike among the patients whose physical conditions are not greatly impaired by other causes than homesickness

In some isolated cases, it becomes imperative to return the cats to their homes to prevent fatal results. Canned salmon, finely ground, raw, lean beef, wild game and meat extracts are used for special diets. Cats may often be induced to partake of the general diet if a small portion of liver, which has been boiled and then baked, be grated over the feed. A small portion of freshly ground catnip mixed in the feed will sometimes induce them to eat.

In a discussion on feeds and feeding of the canine and feline, it would be unfair not to mention the different preparations of proprietary feeds, but it is not the purpose of this paper to recommend any special make. There are many different kinds of dog and cat biscuits, meals and cereals that are very good and may be used in conjunction with other feed, but which do not contain sufficient protein to warrant their use exclusively. The principal objection for hospital use is the cost. A number of canned foods may be obtained, and most of these preparations have meat for a base, with a varied amount of cereals and cod-liver oil. Some of these meet the requirements of a balanced ration, but are lacking in bulk, and too costly to be used except for emergency or a special diet.

Water Has Important Rôle

Water has a prominent part in digestion and is essential as a food. Every patient should be provided with pure, potable, cold water, in unlimited quantities, except with cases where it is necessary to provide cold or warm water in limited quantities. Sometimes it must be withheld entirely for a period of time. For all operative patients receiving a general anesthetic, water should be withheld for at least three hours before the operation, to prevent nausea and vomiting during and immediately following the operation. Water should also be withheld until the patient is fully awake. Then small amounts should be given at body temperature, at three-hour intervals for a period of twelve hours. This will sometimes prevent vomiting and gas pains following an abdominal operation. Some patients which refuse water entirely may take cracked ice. Others have a tendency to drink too much. This may be partially corrected by adding one teaspoonful of lemon-juice to each pint of water.

Forced feeding is resorted to when some physical disability exists to such an extent that the patient refuses to eat or is too weak to take nourishment unaided. The two methods used are

by mouth and per rectum. By mouth, liquids may be given in the form of raw eggs, beef-juice, predigested beef compounds and concentrated broths. All meat preparations should be given warm, the amount and number of feedings to be regulated according to each individual case.

Nourishing enemas are resorted to only when patients cannot be given feedings by the mouth. Starch-water enemas are used as a vehicle and are prepared by dissolving one ounce of corn starch in sufficient cold water to make a thick paste. Pour on boiling water until the starch become of the consistency of mucilage. To this add three ounces of the following solution and give at body temperature: peptonized milk, ounces ten; whites of two eggs; alcohol, drachms two; pinch of salt. Predigested beef compound may be substituted for alcohol. This solution may be given every three hours to either dogs or cats. However, I do not consider forced feeding in cats ever to be very practical, for the restraint necessary to give the feeding often weakens the patient more than the feeding can overcome.

In conclusion, I will say that a very usual belief entertained by the general public is that it is unwise to feed dogs or cats very much meat, the theory being that because they live under unnatural conditions they should not enjoy their natural diet. The more practical suggestion is that it is wiser to make the conditions under which they live as natural as possible and feed them as nearly as possible according to the diet of their undomesticated relatives.

I believe that if we educate our clientele to carry on with this idea, it will not only be a benefit to our canine and feline friends, but in future will reflect credit upon the veterinary profession through the percentage of fatalities being diminished. This will be brought about by the development of animals to such a high resistance that they are able to combat disease through proper feeds and feeding.

Discussion

Dr. R. A. Button: I noted that Dr. Brown fed a larger amount of meats in his regular hospital diet than what we do. The reason for that, I think, on our part, is because it is a little cheaper to feed more cereals. Otherwise I believe the meat diet is just as good, if not better.

Another thing, he did not mention the use of fish. We often use quite a bit of canned fish in our diet. I recall a man who raised Airedale dogs and German shepherds, and he raised really the most hardy puppies and dogs I have ever seen. He happened to be a butcher, and as soon as the puppies are able to eat at all, which is around three or four weeks old, they are allowed to eat all the raw meat they wish, with all the raw milk they wish. I have observed this man for some three years, and during that time he has

had as high as ten and fifteen brood bitches, with the best results of raising puppies of any man in our territory. That is raw meat and raw milk, no cereals. They do not get "pot-gutted." They really look better than any of the puppies around there. I rather think it would be impractical to try to tell your clients to do that—just feed raw milk and raw meat—but it really worked out all right.

I notice also that he recommends the use of corn meal. We have kept from feeding corn meal ourselves, more from the fact that some of the kennel men have said upon experiment that they could tell by an autopsy on a dog's bowel exactly when corn meal was being fed and when it was not being fed, by the intestinal irritation. I do not know whether that is a fact or not. We do not use the corn meal.

I did not notice any reference made to the use of certain foods with relation to disease. For instance, our so-called "running-fits" or "fright disease," many of us have been in the dark about what really caused the running fits, and I know we are not all together on this, but it is the general opinion that the running fit is due to a dietary condition. Of course, some of the articles, I think, in some of the magazines, have laid it to the hookworm. The hookworm will probably cause the running fits, but ourselves, we have done quite a bit of autopsying and a little experimenting, and know that not all the running fits are caused by hookworms, but can be produced by a certain diet. For illustration, I have a kennel man in mind who bought a large amount of a certain food, which I will not mention, that was slightly moulded. He bought it at a reduced price, and after the spring shows this year, started feeding this new feed. He has a kennel of about fifty dogs. He fed this feed, within two or three weeks, to all of his dogs with the exception of two. It was but a few weeks, I will not state the time exactly, until he produced running fits in over ninety per cent of those dogs that were eating this food. These two dogs that were not eating it did not develop fits. He came in to me, thinking that he had gotten distemper from the kennel shows, but I found upon investigation that it was not that. The young dogs, particularly these two that he had not been feeding the food to, were two of the young dogs that were shown. This would eliminate distemper; and I suggested to him, without saying anything particularly against his food, to discontinue this biscuit that he had gotten, which he did. He fed another diet to the dogs for a period of ten days or two weeks, and reported to me that everything was fine and dandy. I tried to help him get rid of this biscuit that he had bought. We put them back on it again. We did a few times with the same result, producing the running fits by going back to this food, until he himself was positive that that was the cause of it.

Along about this time I tried it on a few different cases, and have been able to produce it with the same food. This was with individual cases, and I am sure that the diet is one of the causes of running fits or fright disease.

Dr. Otto Ruehle: As far as my limited experience goes, this is the only paper of its kind that I have ever heard, and in discussing a question of this kind, you will readily see that it is quite important to gain the confidence of the client. There has been a lot of difference of opinion regarding the advice to the client about feeding; some of us are very strong for a meat diet; others are very strong for a vegetable diet. We have some clients who have been advised one way and then the other. One of us recommends a meat diet, and the other a vegetable diet, and the result is that they are very undecided as to whom to abide by in the way of advice.

Now, just to illustrate, we had a client who had a little Pekingese dog with distemper, and we had quite a time getting it to take any nourishment at all. Finally, we tried it on canned salmon. It took to this canned salmon and got along very nicely. While the dog was being discharged from the hospital, and in a convalescent state, I told the owner that the only thing we could get the dog to eat was the canned salmon, and the dog was doing nicely on it. The owner threw up her hands in horror and said: "You don't mean to say you are feeding that dog salmon. I thought that would kill my dog!" We told her it would not, that the dog would do well on it. She never brought the dog back to the hospital; she probably took him somewhere else. That is just one of the ways in which I believe this paper will help us.

DR. BROWN: In reference to Dr. Button's discussion of corn meal in the diet. This has been successfully used by a Chicago veterinarian for fifteen years as a general diet. I have seen dogs, that have been there for a period of five years, fed this diet. Whether kennel men could tell by an autopsy of any of these, if a bowel irritation was present, if it was due to feeding of corn meal, I do not know. I believe the trouble, if any, in feeding corn meal is due to the fact that people feed too much, and not enough meat, especially for puppies, for, like babies, they will eat anything given them, if in good health, and will not eat too much. Another thing that has puzzled me—a client comes to me and says, "I have been advised not to feed meat." In my experience that seems to be a generalized opinion among the laity.

But if we get together and advertise the fact that people should feed their dogs meat, that it is their natural diet, we will have healthier dogs, because meat does not produce surplus fat like a vegetable diet does.

I know one veterinarian who advises a vegetable diet only. There was seldom a time he did not advertise the fact that he did not want his clients to feed their dogs meat. As a result, his patients developed more skin troubles than those of any veterinarian I have ever met.

I did not mean to take up the constituents of the stomach juices or anything of that kind, but meat is readily taken up by the acid condition of the stomach and changed into peptones. A vegetable diet, in any large amount, will not be affected at all by the hydrochloric acid in the stomach. Consequently, if you feed a lot of vegetables you are not going to have any digestion to speak of, except possibly a laxative effect, and the only thing that I really believe the vegetable diet is essential for is for its laxative effect and for its bulk. Meat in a concentrated form has not enough bulk; but meat will build up a stronger dog, and we will have dogs that will stand distemper. I find in practice that dogs, which have been fed on meat right along, stand distemper much better than dogs on any other diet that you can give them.

In reference to the running fits, it is my opinion that the cause of running fits is a dietetic error in most cases; it might not be in all cases. I produced the same trouble by feeding a dog biscuit, and when I was with Dr. Flynn in Kansas City, we produced it there in the kennel by feeding a certain dog biscuit. Then we kept that dog off of that dog biscuit and gave him a laxative—we had more than one, for that matter—and put him on a meat diet, and he recovered in nice shape. We have produced the same thing again, and then the dog made a nice recovery when we changed the diet again. We gave some of those dogs away, and one of them had one spasm afterwards and that was all.

We also took the biscuit and tried to get a laboratory examination, to see if we could determine what was causing the trouble, but the laboratory was unable to find anything in the feed. However, I think most of those running fits are due to either worms, the beginning of distemper, or protein poisoning, which is taken from the food. There is much experimental work that can be done in feeds and feeding, but if we can get the veterinarians to advise more of a meat diet, I think we will have stronger dogs to work with in the future than we have had in the past, because I find that with a vegetable diet, even the small dogs—the little Pekingese and the pups—go to pieces whenever they get distemper or anything of that kind; they have not the vitality to build on.

Of course, in a hospital, you can not directly change a dog from one diet to another. For instance, dogs that have never had a diet of meat must be trained to eat meat, but after you get such dogs trained, you will have difficulty putting them on a vegetable diet, because they will not take it.

DR. T. E. SLEETH: I would like to ask Dr. Brown if he feeds raw meat or cooked meat. If he feeds cooked meat, does he put salt in the meat when he is cooking it?

DR. BROWN: As I said in the paper, the practical way would be to cook the meat. Often we must take into consideration the way clients look at it. They have not been educated to the fact that dogs should have a raw-meat diet; if you put them on a raw-meat diet, they think you are wrong; consequently, I advise a cooked-meat diet, giving the broth that the meats are

cooked in. If you do not do this, you will lose some of the constituents of the meat. I salt it just as if I were salting it for human consumption. In addition to that, I advise feeding raw meat, and, as Dr. Button stated, one kennel fed raw meat and whole milk. I know kennels that are feeding nothing else but raw meat and whole milk and are having very good success.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

WONDERING

I wonder, when my name is called upon that final Judgment Day,
When the Recording Angel will take up the book and say,
"These are thy sins—some wrought and some good deeds left undone;
Here they are clearly written as they happened, one by one."

Then he will turn the other page and reverently scan
The good deeds I have done to try to help my fellow man;
Maybe some time I've kissed away a slowly falling tear,
Or cuddled up a little one to still some childish fear.

Perhaps—who knows? With quip or joke I've brought a laggard smile,
To add a bit of brightness to some sad life awhile—
A little gift to some poor soul to help him on the road,
Or put a shoulder to a wheel to lift some heavy load.

When all the good and all the bad before me are arrayed,
All in the scales of Justice—perhaps I'll feel afraid;
I'll wonder if the good I've done will outweigh all the ill;
And if the final verdict will my fondest hopes fulfill.

I wonder if from pastures fair in that eternal day
Will gather "those that cannot speak" and their grateful eyes will say,
"He healed my wounds, he helped me and he assuaged my pain;
He made my hard lot easier—and not for worldly gain."

If this occurs, then I shall know my life was not mis-spent;
I've done my work as best I could, and I shall rest content.

N. S. MAYO.

Chicago, Illinois.

HOSPITAL SANITATION*

By J. F. McKenna, *Fresno, Cal.*

The subject of hospital sanitation which has been assigned to me, to be presented under this Section, will be confined in this paper to small-animal institutions.

In order to present this subject from a clear and understandable standpoint, we must first consider construction, for, if sanitation and cleanliness are not given consideration in the construction of a small-animal hospital, then, sanitation will be almost impossible to bring about after a building has been completed. Veterinary or small-animal hospital construction has undergone considerable change during the last fifteen or twenty years. The low, dark dens, or kennels, apparently contrived with the object of excluding light and air, where cats and dogs were placed years ago, and perhaps in some localities today, are perhaps some of the chief reasons why the general public hesitate, or refuse entirely, to send their valuable pets to an institution to be treated.

Canine and feline hospitals are still in their infancy, and I think it is safe to predict, that, within the next twenty years, many cities, which at present hardly support one or two institutions, will be suitable fields for several large small-animal hospitals, for, as time goes on, the public will gradually become educated to the fact that it is possible to send their pets to an institution for board and treatment, without the danger of having them infected with some of the diseases so prevalent in canine and feline medicine.

A general knowledge of materials, as well as principles of hospital construction, is a point of some importance to the veterinarian, although it must not be supposed that he is an architect, or builder. Nevertheless, he should be in possession of certain facts connected with building, which have their sanitary aspects. This will enable him, in conjunction with his knowledge of hygiene, to give an opinion on the building of an institution which is to be maintained to house and care for pets.

From a sanitary standpoint, careful consideration should be given to every detail, including the reception room, offices, operating rooms, wards and kennels. To begin with, I do not

*Presented at the sixty-second annual meeting of the American Veterinary Medical Association, Portland, Oregon, July 21-24, 1925.

believe that the operating room, examination room, or any ward in which animals are to be housed for any length of time, should be too close to the offices or reception room, for, naturally, any room in which a dog is kept is bound to give off an odor at certain times, and these rooms can just as well be placed some little distance back, or apart from the front offices.

Ventilation, for summer and winter, is a considerable problem, and if the building is to be one story, this can be arranged through suitable-sized ventilators, extending through the roof, whereas, if it is a two-story building, these ventilators can be placed in the outside walls, or go up through the top floors in proper conveyances.

Light is one of our cardinal requirements, from a sanitary and economic standpoint, for its convenience to the veterinarian and his assistants, and also for its effect on the patients and the owners.

Small-animal hospital construction, along the line of wards and special rooms for each particular line of work, is naturally more convenient and easier to keep in a sanitary condition than a building so constructed that the general hospital is in an open space

Construction of Kennels Important

The construction of kennels for the wards should have serious consideration. In my opinion, whether or not the same be constructed of iron or wood, they should be portable, so that they can be cleaned thoroughly. Also, with this type of kennel, they are easily moved outside the ward for thorough disinfection.

Walls and floors should be constructed of material that is easily cleaned, and with proper drainage and sewer connections in the floor.

Plumbing connections, in the way of hot and cold water into each room, make it easy for attendants to keep the rooms clean.

With proper ventilation, sunlight, plenty of hot water and soap, wards, kennels, etc., can be kept free of odor and clean, without the use of strong disinfectants, which, as a rule, have a disagreeable odor. However, at times, it is necessary to disinfect the kennels and rooms thoroughly, and materials suitable for this use are well known to all of us.

Dogs, particularly, should have outside runs, and whether or not these connect directly with the wards, they should, if possible, be dirt floors, with iron gates, and strong wire partitions, for it

is far better to have a number of runs, so that it is not necessary to put animals together. These runs, together with all openings into the building proper, should be thoroughly screened, as a means for the elimination of flies. The runs should be kept clean, and at frequent intervals a deodorant should be used on them.

A bathroom should be maintained, which is separate from the wards, where dogs can be washed, clipped, and work of this nature carried on, and thus prevent the soiling of wards or operating room.

Examination-Room a Convenience

A separate room for the examination of our cases is found to be quite a convenience. It eliminates the use of the operating room for minor surgery; thus enabling you to keep your main operating room in a neat, clean, orderly manner at all times.

The instrument cases, and in fact all equipment in the examination and operating rooms, should be of materials easily cleaned, and proper receptacles should be kept in all rooms for waste and soiled material.

These rooms should be kept in a most orderly manner, and tables and equipment rinsed and cleaned after each case. Tables, walls and floors of these rooms should be constructed of materials easily cleaned, with suitable drainage in same, and the proper plumbing features are quite essential.

Veterinarians conducting small-animal hospitals today will do well to follow in the footsteps, even though it be on a small scale, of those conducting institutions which have been, and are being operated for the care of the human being.

The personal appearance of your attendants and the clothing they wear is of some importance. The cost of laundering gowns is trivial in comparison with the effect it has on your clients.

The fees charged for the care and treatment of dogs and cats should be in keeping with the expense of operating institutions such as the majority of clients desire and, as time goes on, and more institutions are established and properly conducted, from a sanitary standpoint, for the treatment of small animals, the public at large will become educated to the use of these institutions, and the profession as a whole will be given greater credit and more respect.

Lexington! Let's Go!

CASTOR OIL*

By O. A. LONGLEY, *San Francisco, Calif.*

Upon inquiring into the history of digestive troubles of dogs, especially to determine what treatment has been administered prior to seeking professional aid, we have been impressed with the frequency with which castor oil is given. Dogs suffering from gastritis, colic, acute indigestion, intestinal obstruction, enteritis and similar digestive ailments that have received a dose of castor oil, invariably manifest more acute symptoms than cases that have not been subjected to this torture, and are always much slower in recovering. Because of these clinical manifestations, together with the greasy, dirty and altogether offensive character of castor oil, we have developed an aversion to it as a remedial agent and really believe it does more harm than good in the majority of cases.

Medical history indicates that castor oil is one of our oldest cathartics. Popular use for centuries probably accounts for the fact that it is so commonly used today by the ignorant layman and by the thoughtless veterinarian and physician. I say thoughtless, because no thinking medical man who has carefully looked into all the actions and after-effects of castor oil can conscientiously administer it or advise its use except for greasing axles. No doubt, castor oil was good medicine when King Tut was a pup, but in the light of more modern medicine, it should be considered a relic of the Dark Ages and its use discarded. Many modern agents, devoid of such harmful effects as are possessed by castor oil, are available and are being substituted therefor by modern men in all branches of the medical profession.

It is useless to take the time to mention the long list of available modern and satisfactory laxatives and cathartics, because almost any of these of a non-irritating nature is better than castor oil. A little thought on the subject will enable any veterinarian to make his own selection for each type of case.

The action of castor oil is not only by lubrication but mainly by irritation, and while it does empty the intestinal tract, the immediate after-effect is the total and complete collapse of the intestines, accompanied or followed by a paralysis of the muscular coat for several hours after the lumen is emptied. Normal func-

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tioning ceases, and the intestines lie dormant during this interval, which defeats the very object for which it is given and cannot be beneficial to our sick patient. Other agents are just as effective without this undesirable after-effect, and the more modern medical men, both veterinary and human, have discarded castor oil.

As a lover of dogs, I appeal to you to give them some consideration and not use castor oil or prescribe it thoughtlessly. I cannot bring myself to believe we are being considerate of our patients in forcing vile, unsavory castor oil down their throats, when there are so many other agents, not so disagreeable to take, that have a much better effect.

In referring to the pharmacopeia and our books on materia medica, we find that castor oil is pressed or extracted from the castor bean, and that castor beans and the leaves of the castor plant are a drastic and irritating poison. The administration of as few as three beans have been known to be fatal to the human. There are whole columns printed in these books describing means of extraction that will reduce to the minimum the irritating properties contained in the extracted oil. Is this not significant?

In modern times, when every effort is made to obtain the maximum amount of any product from a given amount of crude material, thought and care are not always given to extracting the active principle in a manner that will be best for the final result. In other words, every effort is made to obtain all the oil there is in the castor bean, and in doing this, most of the castor oil of today probably contains more irritating properties than the castor oil of several hundred years ago and, because of this, I believe we are getting more detrimental effects from modern castor oil than we did from the castor oil that was originally introduced in medicine.

Again I appeal to you to be more considerate of the animals under your care, and do not force castor oil upon or into them. Treat yourself to the satisfaction of giving the trustful dog a more savory laxative, one over which he will lick his chops, and see if both you and he will not be happier.

Where Lies the Kick

Jeannette—I wish you wouldn't chew gum. Don't you know it's made out of horses' hoofs?

Hilda—Sure; that's why I get a kick out of it.

—Detroit *Times*.

MISCELLANEOUS ANTHELMINTIC INVESTIGATIONS

By MAURICE C. HALL* *and* MEYER WIGDOR*

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INTRODUCTORY

This series of papers is intended to make available the results of experiments carried out by us in 1917 and 1918. These experiments were terminated when the writers entered the Army, and there has been no opportunity to write up the results until the present time. While some of the results merely indicate that certain substances have but little value against the worms present in the test animals, nevertheless, inquiries are made from time to time in regard to the true value of such substances, and any definite information should be made available. Since the completion of our work, other investigators have published articles on similar problems, and references to these papers, which were not published when we did our work, are noted in these reports.

1. Hydrocarbons and Related Products

THEORETICAL CONSIDERATIONS

This study of the terpenes and certain other aromatic hydrocarbons, and incidentally of kerosene, was a very unpretentious attempt to see if we could correlate anthelmintic efficacy with chemical composition. At the time the work was done it appears to have been the first attempt of the sort. It was a preliminary study, and after its interruption, no further work was done, the correlations remaining unestablished. Since that time the extensive and highly scientific studies of Caius and Mhaskar have appeared and shown something of what may be expected from a study of correlation of anthelmintic efficacy and chemical composition. Later papers by Hall and Shillinger (1925) and Hall and Cram (1925) have extended certain chemical correlations and noted certain possible correlations of anthelmintic efficacy with physical properties. The present paper affords little except some definite information in regard to the substances tested, the data being inadequate for establishing any approximately exact correlation with chemical composition.

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*Resigned 1918.

The simplest of the aromatic hydrocarbons is benzene, C_6H_6, with the carbon atoms linked in a ring and each one combined with an atom of hydrogen, these hydrogen atoms being readily replaceable by other elements or radicals. A closely related compound is the hexahydrobenzene ring (C_6H_{12}), which also has readily replaceable hydrogen atoms. Of these ring derivatives, we tested toluene, xylene, limonene, terebene, terpineol, cineol, and incidentally oil of eucalyptus for its cineol content and spruce turpentine because of its cymene content. Kerosene was also tested. While other worms are noted in the following protocols, ascarids were regarded as the primary test-worms.

The protocol data are given in the following order: number of dog; weight of dog; dose or dose rate; purgative and amount (this was given simultaneously with the chemical under test); worms passed in four days; worms present postmortem; and indicated efficacy of the treatment.

PROTOCOLS

Terebene: This is a mixture of terpenes of the general formula $C_{10}H_{16}$.

Dog 272; 9 kilograms; 0.1 cc per kilogram; castor oil, 30 cc; 5 ascarids; postmortem, 3 ascarids and 7 *Dipylidium*; 62 per cent for ascarids.

Dog 291; 11 kilos; 0.2 cc p. k.; castor oil, 30 cc; no worms; postmortem, 6 ascarids and 179 whipworms; 0 per cent for ascarids.

Dog 344; 13 kilos; 0.4 cc p. k.; castor oil, 30 cc; 2 ascarids; postmortem, 19 ascarids; 9 per cent for ascarids.

Xylene: This chemical, also called xylol, is dimethylbenzene, C_6H_4-CH_3-CH_3.

Dog 262; 7.5 kilos; 0.1 cc p. k.; castor oil, 30 cc; 4 ascarids; postmortem, 9 ascarids; 31 per cent for ascarids.

Dog 288; 14.5 kilos; 0.2 cc p. k.; no purge; 1 ascarid; postmortem, no worms; 100 per cent for ascarids.

Dog 338; 13 kilos; 0.2 cc p. k.; castor oil, 30 cc; no worms; postmortem, 1 ascarid, 10 hookworms, and 1 *Didylidium*; 0 per cent for ascarids.

Dog 341; 8 kilos; 0.3 cc p. k.; castor oil, 30 cc; 15 ascarids; postmortem, 10 ascarids; 60 per cent for ascarids.

Dog 345; 7 kilos; 0.4 cc p. k.; castor oil, 30 cc; 4 ascarids; postmortem, no worms; 100 per cent for ascarids.

Toluene: This chemical, also called toluol, is methylbenzene, C_6H_5-CH_3.

Dog 260; 9 kilos; 0.1 cc p. k.; castor oil, 30 cc; 3 ascarids; postmortem, 19 ascarids; 14 per cent for ascarids.

Dog 290; 12.5 kilos; 0.2 cc p. k.; no purge; no worms; postmortem, no worms; no conclusions.

Dog 317; 7 kilos; 0.2 cc p. k.; no purge; 2 ascarids, plus 1 in large intestine, postmortem; postmortem, 104 ascarids and 42 whipworms; 3 per cent for ascarids, but dog dead in 24 hours, so no conclusions.

Dog 342; 7 kilos; 0.3 cc p. k.; castor oil, 30 cc; no worms; postmortem, no worms; no conclusions.

Dog 346; 11 kilos; 0.4 cc p. k.; castor oil, 30 cc; 3 ascarids; postmortem, no worms; 100 per cent for ascarids.

Spruce turpentine: This substance has cymene, methylisopropylbenzene, C_6H_4-CH_3-C_3H_7, as a constituent.

Dog 358; 12 kilos; 0.1 cc p. k.; no purge; 1 ascarid; postmortem, 9 ascarids, 3 whipworms, and 6 *Dipylidium*; 10 per cent for ascarids.

Dog 359; 11 kilos; 0.1 cc p. k.; no purge; no worms; postmortem, no worms; no conclusions.

Dog 360; 11 kilos; 0.1 cc p. k.; no purge; no worms; postmortem, 4 ascarids; 0 per cent for ascarids.

Dog 361; 11 kilos; 0.2 cc p. k.; no purge; no worms; postmortem, no worms; no conclusions.

Dog 362; 15 kilos; 0.2 cc p. k.; no purge; 2 ascarids; postmortem, 3 ascarids and 3 *Dipylidium*; 40 per cent for ascarids.

Dog 363; 12 kilos; 0.2 cc p. k.; no purge; no worms; postmortem, 15 ascarids; 0 per cent against ascarids.

Cineol: This chemical, also called eucalyptol and cajeputol, is C_6H_8O-C_3H_7-CH_3.

Dog 263; 10 kilos; 0.1 cc p. k.; no purge; no worms; postmortem, 3 ascarids; 0 per cent for ascarids.

Oil of eucalyptus: This chemical, which contains cineol as a constituent, has been used in Hermann's mixture for the treatment of human uncinariasis, and has been shown in human medicine to have little or no anthelmintic value for hookworms. Our results agree with this.

Dog 186; 12 kilos; 10 minims plus 20 minims of oil of sweet almonds; castor oil, 30 cc; no worms; postmortem, 2 hookworms, 14 whipworms, 5 *Taenia*, and 3 *Dipylidium*; 0 per cent for hookworms.

Dog 305; 7.5 kilos; 15 minims; castor oil, 30 cc; no worms; postmortem, 1 ascarid; 0 per cent for ascarids.

Limonene: This benzene derivative, also called dipentene, diamylene, or cajeputene (inactive limonene), is C_6H_6-CH_3-C_3H_7.

Dog 279; 10.5 kilos; 0.1 cc p. k.; castor oil, 30 cc; no worms; postmortem, 3 ascarids and 128 *Dipylidium*; 0 per cent for ascarids.

Kerosene: This is an indefinite mixture of hydrocarbons, defined in a general way by the limits of its boiling-points and its specific gravity.

Dog 277; 16.5 kilos; 0.1 cc p. k.; castor oil, 30 cc; no worms; postmortem 4 hookworms and 1 *Dipylidium*; 0 per cent for hookworms.

Dog 278; 16.5 kilos; 0.1 cc p. k.; castor oil, 30 cc; no worms; postmortem, 2 ascarids and 177 *Dipylidium*; 0 per cent for ascarids.

Discussion

Comparing equivalent doses, the percentage efficacy against ascarids, of the various substances tested, is as follows:

At 0.1 cc per kilo: terebene, 62; zylene, 31; toluene, 14; spruce turpentine, 10 and 0 (average of 5); terpineol, cineol, oil of eucalyptus, limonene, and kerosene, 0.

At 0.2 cc per kilo: xylene, 100 and 0 (average of 50); spruce turpentine, 40 and 0 (average of 20); toluene, 3 (dog died too soon for definite test); terebene, 0.

At 0.3 cc per kilo: xylene, 60.

At 0.4 cc per kilo: toluene and zylene, 100; terebene, 9.

One may judge from the above that terebene, zylene, toluene and spruce turpentine have some ascaricidal value, though not sufficiently marked to make them useful in competition with such effective drugs as chenopodium and santonin. Apparently terpineol, cineol, oil of eucalyptus, limonene and kerosene have no ascaricidal value or almost none. However, an attempt to correlate the moderate efficacy of the first group and the lack of efficacy of the second group with their chemical composition leads to no positive conclusions. In both groups we have bene-

zene- and hexahydrobenzene-ring products, kerosene falling outside of these groups. In both groups, we have methyl and propyl radicals substituted for hydrogen in the ring.

The ubiquitous benzene ring or the hexahydrobenzene ring is present in many of the most important anthelmintics such as thymol, chenopodium, turpentine, betanaphthol, male fern, kousso, kamala, etc. These and other anthelmintics have been studied by Caius and Mhaskar, with a view to correlating their chemical composition with their anthelmintic efficacy in removing hookworms. They investigated 70 compounds, and in their summary (1923) report that 20 had marked anthelmintic efficacy against hookworms. All of the 20 are carbon compounds and they fall into a small group of open-chain or aliphatic compounds and a large group of closed-chain or aromatic compounds. The open-chain or aliphatic compounds include the two halogen derivatives of hydrocarbons, chloroform and carbon tetrachlorid, to which should be added tetrachlorethylene, recently proposed by Hall and Shillinger (1925), and methylnonylketone (oleum rutae). Disregarding the last compound, we have here a group of halogen derivatives of open-chain compounds.

On a consideration of their findings, Caius and Mhaskar (1923) are unable to establish any general correlation between anthelmintic efficacy and chemical composition. The four most effective compounds differ widely in many respects. They state, however: "If taken individually it may be proved that the therapeutic value of the substance is correlated with some particular grouping or structure in the molecule: the cumulative effect of the halogen atoms in carbon tetrachlorid, the free phenolic hydroxyl group in thymol and betanaphthol, the peroxide structure in ascaridol." Since these factors can not yet be correlated, Caius and Mhaskar conclude that anthelmintic action is specific.

It is evident that we have as yet too little data from which to draw conclusions. Most anthelmintics are effective against only certain kinds of worms; tested against other kinds they would be regarded as inert. An adequate consideration of this phase of the matter will be impossible until we know something as to the way in which given anthelmintics affect worms, a subject concerning which we know practically nothing. With much more adequate data, it is possible that coordinations and correlations will be possible.

Conclusions

Critical tests of various hydrocarbons show varying degrees of efficacy in removing ascarids, but an examination of the data does not afford adequate evidence on which to correlate the chemical composition with the efficacy in the tests. Additional data are needed.

Certain of the hydrocarbons tested show evidence of fairly dependable efficacy against ascarids at a dose rate of 0.4 cc per kilo, but not at lower dose-rates. How safe or desirable these substances might be in such high doses is a question. There was some evidence that they were responsible for some gastro-intestinal inflammation and nephritis in some cases.

The point is emphasized that the important anthelmintics are hydrocarbons and their derivatives, falling into two major groups as follows:

I. Open-chain compounds, of which the important members are halogen derivatives of methane, ethylene and related hydrocarbons.

II. Closed-chain compounds of the benzene and the hexahydrobenzene rings.

Many members of group II have long been in use as anthelmintics for removing roundworms and tapeworms. Group I is still small, but is being enlarged and many more of its possible compounds should be investigated in a search for anthelmintics, especially for such as may be valuable in removing hookworms.

2. Tests of Tapeworm Treatments

Critical tests of tapeworm remedies have been made to a much lesser extent than have critical tests of drugs for the removal of nematodes. In general, anthelmintics for removing tapeworms appear to be more uncertain and erratic in their action than those for removing nematodes, the uncertainty being credited by most writers to the difficulty of removing the head and thus preventing the regeneration of the strobila. However, we may note in this connection that the statement that worms of any given kind are more difficult to remove than worms of some other kind is not a very accurate one. Given the proper drugs and conditions, it is substantially as easy to remove any one kind of worms as any other kind; the difficulty lies in our ignorance of the proper drug or the proper administration of the drug. It was said for many years that hookworms were more difficult to remove than ascarids, but at present it is

substantially as easy to remove hookworms as to remove ascarids. With more information in regard to anthelmintics for removing tapeworms, it will probably be as easy to remove them as to remove nematodes. In this paper, we are presenting some additional evidence as to the value and dependability of certain drugs, these data being an addition to the small amount of data now available on this subject. The tests reported here were made by us in 1917 and 1918 or by the senior author at an earlier date, 1916 and 1917. They include tests of certain standard remedies and of certain proprietary remedies which are more or less used.

The protocols cover the data in this order: number of dog; weight of dog in kilograms (abbreviated to kilos); dose, or dose-rate, in cubic centimeters per kilogram of dog's weight (abbreviated to cc p. k.); purgative; worms passed; worms present postmortem; and efficacy of the drug expressed as a percentage of the worms passed in relation to the total number originally present.

Protocols of Tests of Standard Drugs

Kamala: Dog 3; 4.5 kilos; 2 cc of powder in simple syrup; no purgative; no worms; postmortem, 4 whipworms; no conclusions regarding tapeworms. This dog, a distemper case and hence a poor subject for anthelmintic medication, was dead on the third day.

Dog 5; 5 kilos; 0.5 dram of powder in simple syrup; castor oil, 15 cc; no worms; postmortem, 17 *Dipylidium sexcoronatum*; 0 per cent for tapeworms.

Dog 11; 13 kilos; 9 cc of powder in simple syrup; no purgative; several *Dipylidium* sp.; postmortem, 2 ascarids; 100 per cent for tapeworms.

Dog 20; 11 kilos; 10 cc of powder in simple syrup; no purgative; several tapeworms; postmortem, 2 ascarids, 1 hookworm, 4 whipworms; 100 per cent for tapeworms.

Fluidextract of kamala: Dog 24; 7.5 kilos; 8 cc of extract in 24 cc water; no purgative; 2 *Dipylidium* sp.; postmortem, 2 hookworms and 2 whipworms, with 1 ascarid in large intestine (the latter apparently removed by drug); 100 per cent for tapeworms.

Dog 48; 11 kilos; 8 cc of extract in 24 cc water; no purgative; no worms; postmortem, 37 *Dipylidium* sp.; and 1 hookworm; 0 per cent for tapeworms.

Areca nut (freshly powdered): Dog 85; 7 kilos (15.4 pounds); 2 grains per pound (ca. 2 grams) in simple syrup; no purgative; no worms; postmortem, 16 *Dipylidium*, 1 whipworm; 0 per cent for tapeworms.

Dog 90; 10 kilos; 5 grams in simple syrup; no purgative; 1 hookworm; postmortem, 2 *Dipylidium*, 6 hookworms; 0 per cent for tapeworms.

Dog 316; 21 kilos; 6.5 grams in simple syrup; no purgative; 10 *Dipylidium* first day and 7 the second day; postmortem, 1 hookworm; 100 per cent for tapeworm.

Dog 339; 14.5 kilos; 4.5 grams in simple syrup; no purgative; 1 *Taenia* sp. first day and 1 the second day; postmortem, no worms; 100 per cent for tapeworms.

Pelletierine tannate: Dog 255; 20.5 kilos; 4 grains; castor oil, 1 ounce, 2 hours later; no worms; postmortem, no worms; no conclusions.

Dog 257; 22.5 kilos; 4 grains; calomel, 2 grains; no worms; 6 days later, 6 grains; calomel, 4 grains; no worms; postmortem, 7 *Taenia pisiformis*, 6 *Dipylidium* sp.; 0 per cent for tapeworms.

Dog 270; 12.5 kilos; 0.8 gram; calomel, 4 grains; no worms; postmortem, 37 *Dipylidium* sp., 1 ascarid, 4 whipworms; 0 per cent for tapeworms.

Dog 274; 15.5 kilos; 1.15 grams; calomel, 4 grains, 3 hours later; no worms; postmortem, 6 *Taenia pisiformis*, 27 *Dipylidium* sp., 15 whipworms; 0 per cent for tapeworms.

Oleoresin of male fern: Dog 219; 11 kilos; 2 cc; castor oil, 30 cc; 10 *Dipylidium* sp., 1 ascarid; postmortem, 1 ascarid, 1 whipworm; 100 per cent for tapeworms.

Dog 145; 11.5 kilos; 20 cc (lethal dose); castor oil, 60 cc; 3 *Dipylidium* sp.; postmortem, 2 ascarids, 7 hookworms; 100 per cent for tapeworms; dog survived lethal dose, apparently from protective action of large dose of castor oil.

Dog 131; 7.5 kilos; 20 cc; castor oil, 60 cc; no worms; postmortem, no worms; no conclusions; dog survived lethal dose, apparently from protective action of large dose of castor oil.

Dog 171; 8 kilos; 20 cc; castor oil, 30 cc; 32 *Dipylidium* sp.; postmortem, 4 *Dipylidium* sp., 2 hookworms, 2 whipworms; 94 per cent for tapeworms; dog survived lethal dose, apparently from protective action of moderate dose of castor oil. Postmortem on sixth day and tape worms less than 2.5 cm. long (possible infection after treatment).

Dog 180; 9 kilos; 20 cc; calomel, 6 grains; no worms; postmortem, no worms; no conclusions; dog survived lethal dose, apparently from protective action of large dose of calomel.

Dog 185; 8.5 kilos; 20 cc; calomel, 6 grains; no worms; postmortem, 2 *Dipylidium* sp.; apparently 0 per cent for tapeworms, but postmortem on eighth day and worms very small; dog survived lethal dose, apparently from protective action of large dose of calomel.

Dog 172; 10 kilos; 20 cc; no purge; no worms; postmortem, no worms; no conclusions; lethal dose proved fatal in absence of purgative.

Oleoresin of male fern and kamala: Dog 17; 8.5 kilos; male fern, 35 minims, kamala, 20 grains, oil of chenopodium, 25 minims; elaterin, 1/10 grain; 20 ascarids; postmortem, 6 *Dipylidium* sp.; 0 per cent for tapeworms.

Protocols of Tests of Proprietary Drugs

Proprietary A: Dog 5; 5 kilos; prescribed dose; contains purgative; no worms; postmortem, 17 *Dipylidium sexcoronatum*; 0 per cent for tapeworms; product contains kamala.

Dog 7; 9 kilos; 2 to 3 times prescribed dose; contains purgative; 1 ascarid; postmortem, 2 *Dipylidium* sp.; 0 per cent for tapeworms.

Proprietary B: Dog 194; 13 kilos; prescribed dose; castor oil, 30 cc; some tapeworms and 1 ascarid; postmortem, 7 hookworms, 2 whipworms; 100 per cent for tapeworms; product is a pelletierine preparation.

Dog 199; 11.5 kilos; prescribed dose; castor oil, 30 cc; 3 *Taenia* sp.; postmortem, no worms; 100 per cent for tapeworms.

Dog 202; 8.5 kilos; prescribed dose; castor oil, 30 cc; several *Dipylidium* sp., 1 whipworm; postmortem, 1 hookworm; 100 per cent for tapeworms.

Proprietary C: Dog 3; 4.5 kilos; prescribed dose; contains purgative; no worms; dog subsequently used in test of kamala (see above); postmortem, 4 whipworms; no conclusions.

Dog 6; 10 kilos; prescribed dose; contains purgative; no worms; postmortem, no worms; no conclusions; product contains male fern.

Proprietary D: Dog 275; 23 kilos; prescribed dose; contains purgative; 4 *Taenia pisiformis*; postmortem, 3 ascarids, 14 hookworms; 100 per cent for tapeworms.

Proprietary E: Dog 200; 18.5 kilos; prescribed dose; probably contains purgative; no worms; postmortem, 42 *Dipylidium* sp., 1 whipworm; 0 per cent for tapeworms; composition not ascertained.

Dog 201; 11.5 kilos; prescribed dose; probably contains purgative; 16 *Dipylidium* sp.; postmortem, 56 *Dipylidium* sp., 2 ascarids, 9 hookworms; 22 per cent for tapeworms.

The above proprietaries were intended to remove tapeworms, as their names indicated or an analysis of their composition

showed. The following proprietaries bear some general name, such as Vermifuge, Worm Remover, Worm Remedy, etc., and were not analyzed, and may not be intended to remove tapeworms. However, the name suggests that they are intended for worms in general, including tapeworms, and their tests are included here.

Proprietary F: Dog 2; 12.5 kilos; prescribed dose; probably contains purgative; 1 hookworm; postmortem, more than 15 hookworms, more than 2 *Dipylidium* sp.; 0 per cent for tapeworms.

Dog 4; 11.5 kilos; more than prescribed dose; no worms; used in next experiment with proprietary G; no tapeworms, postmortem; no conclusions as to tapeworms.

Proprietary G: Dog 4; 11.5 kilos; prescribed dose; probably contains purgative; 6 ascarids; postmortem, 3 ascarids, 1 hookworm; no conclusions as to tapeworms.

Dog 9; 7.5 kilos; prescribed dose; no worms in 4 days, but 6 ascarids on fifth to seventh days; later treated with chenopodium and passed 2 ascarids and had 4 ascarids postmortem; no conclusions as to tapeworms.

Proprietary H: Dog 8; 6.5 kilos; prescribed dose, probably contains purgative; no worms; postmortem, no worms; no conclusions.

Proprietary I: Dog 21; 10 kilos; prescribed dose; probably contains purgative; no worms; postmortem, no worms; no conclusions.

Discussion

Kamala: In a dose as small as 0.5 gram, kamala was entirely ineffective against tapeworms in the one case in which this dose was tested, but in doses as large as 9 to 100 cc of the powder it was 100 per cent effective in the two cases in which these doses were tested. The dose given by Winslow for dogs is one-half to 2 drams. The dose we gave, 9 to 10 cc, weighs approximately 1.5 drams, or 6 grams, or close to the maximum dose; the dogs weighed a little more than 10 kilograms, which we take as the weight of the average dog. According to the Dispensatory, kamala was long employed in the folk medicine of India and was first brought to the attention of medical men elsewhere by Mackinnon, in 1854. The dose for man is given as 1 to 3 drams. It acts as a purgative, sometimes causing nausea, but rarely vomiting. If purgation does not follow its use the drug may be followed by castor oil. So far as we can judge from such a limited number of experiments, it appears to be an effective drug for removing tapeworms in dogs, when it is used in adequate doses. Its actual dependability could be ascertained only by a much larger series of experiments.

Fluid extract of kamala: This preparation removed all of the tapeworms from one dog and failed to remove any from two dogs. It can not be regarded as dependable in the doses employed. Hall (1918) has noted as one of the principles of anthel-

mintic medication that fluidextracts, or other preparations containing alcohol as a solvent for active anthelmintic ingredients, are frequently unsuitable as anthelmintics. Fluidextract of kamala appears to come within the scope of this rule.

Areca nut: Freshly powdered areca nut removed all of the tapeworms from two dogs and failed to remove any from two others. The doses used were those usually prescribed and the drug can not be regarded as dependable in these doses. In this respect it followed the general rule that, as used at present, tapeworm remedies do not show the dependable action of the best anthelmintics for removing nematodes.

Pelletierine tannate: This drug, in doses up to 1.15 grams, accompanied in all cases by a purgative, failed to remove any tapeworms from the three infested dogs. The drug is therefore not dependable when given in the amounts tested and accompanied by a purgative.

Oleoresin of male fern: In the therapeutic dose, 2 cc for a dog of about average size, this drug removed all of the tapeworms from one infested dog. In lethal doses (20 cc) it removed all the tapeworms from one infested dog and 94 per cent from another; in a third case two very small tapeworms (*Dipylidium*) were present postmortem on the eighth day after treatment, and as these worms could have developed after treatment this case may be disregarded. Oleoresin of male fern may be regarded as the classical treatment for tapeworm removal and is usually dependable, but it fails in a certain proportion of cases, just as it failed to remove all tapeworms in one case here, even though given in a dose regarded as lethal and actually lethal unless given with a large dose of purgative.

Oleoresin of male fern and kamala: Male fern, 35 minims, and kamala, 20 grains, failed to remove tapeworms from one infested dog. In all probability this dose would be effective in some cases, but it is not dependable.

Proprietary drugs: A test of nine proprietary preparations, of which five are specifically intended to remove tapeworms, indicates that two of these (B and D) are apparently effective preparations and one of them (B) shows a rather high degree of dependability, removing all of the tapeworms from three infested dogs. Owing to a lack of tapeworms in the test dogs, nothing was learned in regard to C, G, H and I. Total or partial failures indicate a lack of dependable action for A, E and F.

Earlier Tests and Reports

Kamala: On a casual inspection of the available literature we do not find any reports of critical tests of kamala powder, the literature dealing with clinical findings and experience, which includes a consideration of worms passed but not of worms present postmortem. Tests of the fluidextract reported by Hall (1918) showed it unsatisfactory. Nörr (1924) has recently stated that it is inexplicable to him why new tapeworm remedies are being brought out constantly when we have in kamala a drug which meets all requirements. However, Nörr notes that the drug is not constantly effective and that he has had a failure with it in a dose of 2 grams for a small dog and success in a dose of 1 gram in a very large dog. Our experiments indicate that much larger doses are desirable, but we have not ascertained the safety limits, a thing we should know. Nörr gives kamala mixed with 150 to 200 grams of minced meat after fasting the animal a half-day to one day, and says that it is effective even when vomiting ensues. The Sanskrit "kamalan" and Indian "kamal" mean lotus; in Bengali, the word means lotus and also drug, medicament or healing material. Apparently the drug deserves further study.

Areca nut: Hall and Foster (1918) tested areca nut, ground four years previously, on dogs and chickens. The dogs had no tapeworms, so nothing was learned of the action of the drug as given. It removed less than 1 per cent of the tapeworms from chickens. Regenbogen (1908) reported that using capsules containing areca nut and kamala, 1 gram each, and giving up to 5 capsules for a big dog, he removed tapeworms from 20 of 26 dogs, but as his findings show nothing as to partial failures one can only conclude that the treatment is not entirely dependable.

The present paper takes no consideration of arecolin hydrobromid, but it may be mentioned in passing that Hall and Shillinger (1923) found that this drug removed all the tapeworms in a small majority of cases and failed to remove some or all of the tapeworms present in a large minority of cases. The great value of this drug is the small size of the dose, the fact that it is its own purgative and that it acts rapidly, and that it is a very convenient method of dosing. Veedendaal (1924) reports that he removed tapeworms from 16 of 17 dogs, but without the heads in three cases; his paper does not take

into consideration partial failures as ascertained by postmortem examination or fecal examination. Milks (1923) states that the drug is not as dependable as some other drugs. Ross (1924) tested the drug on 11 dogs and examined seven of these postmortem. Of the seven dogs, one passed no tapeworms and had none postmortem. Six dogs had tapeworms; three of these had only part of their tapeworms removed with one treatment; two of these had all tapeworms removed with two treatments, the first treatment being a partial failure here also; one dog had all its tapeworms removed with one treatment. In these cases the arecolin hydrobromid was a partial failure in the large majority of cases and a complete success in only a small minority of cases, so far as single doses are concerned.

Pelletierine tannate: Hall and Foster (1918) reported critical tests of this drug on two cats, with a failure to remove tapeworms in both cases. In tests on three dogs the drug removed all the *Taenia* from two dogs and no *Dipylidium* (only one present) from the other. These results, coupled with our own, do not indicate that pelletierine tannate is dependable in the doses given, these doses being those regarded as the therapeutic doses.

Oleoresin of male fern: Hall and Foster (1918) report that male fern removed all the *Taenia* from one dog and a large number of *Dipylidium* from another, with one *Dipylidium* left in the latter dog. A test on another dog resulted in the removal of all *Taenia.* Of four infested cats, one died too soon after treatment to permit of conclusions as to efficacy of treatment, and three were completely freed from tapeworms, but one of the three died three days after treatment, indicating that cats do not tolerate 0.8 cc of male fern, even accompanied by calomel, any too well. Clincial experience indicates that this drug will fail from time to time, but on the whole it is still the standard treatment for tapeworm infestation.

According to Richaud (1912) and LeClerc (1921), male fern is the oldest of the anthelmintics now in general use. Theophrastus refers to its use for removing tapeworms and roundworms, and Dioscorides mentions it. Pliny calls it *Filix mas.* It was used in the Middle Ages and is referred to by Marco Gatinerio and Simon Paulli, and in the eleventh century by Avicenna. It appears to have been forgotten subsequently until the eighteenth century, when it was revived as a secret preparation by Mathien in Berlin and by Nuffer, also spelled Nouffer,

in Switzerland. The former sold the secret of his preparation to Frederick the Great for 200 thalers yearly and the title of "Conseiller de Cour"; the latter, according to Richaud, or his widows or heirs, according to LeClerc, sold the secret to Louis XV or Louis XVI (Richaud and LeClerc not in agreement here) for 18,000 livres.

Proprietary drugs: There is nothing to be gained by a review of literature of proprietary drugs. In many cases these drugs do not have the composition stated and their efficacy or lack of efficacy can not be correlated with anything in the mixture unless these constituents and their amounts are known. Our tests of these products were made to ascertain whether such products indicate that unusual value may attach to any of them. Our findings indicate that certain ones, and these are products made by reputable firms and with the composition known, are very good, apparently as good as the best of the generally used drugs of which they are composed. Others appear to be undependable, apparently because of faulty composition or the use of inadequate amounts of potent drugs, in order that the product, often purchased by persons unfamiliar with drugs, may be, first of all, safe in the hands of unskilled and untrained persons.

SUMMARY

Our tests and the published evidence indicate that kamala and male fern are fairly dependable drugs. The proportion of failures to be expected with given doses of these drugs should be ascertained by critical tests on a large series of dogs. Fluidextract of kamala appears to be undesirable.

Freshly powdered areca nut did not give dependable results in our small series of cases; when the drug has been ground a long time it shows very little efficacy. Arecolin hydrobromid is a very convenient drug, but not very dependable. Pelletierine tannate in our tests and previously reported tests appears to be quite undependable in the doses commonly employed.

Proprietary preparations of known composition and containing adequate amounts of the more effective anthelmintics appear to be as effective as the standard anthelmintics for the removal of tapeworms, but many proprietary preparations are unsatisfactory.

The anthelmintics for the removal of tapeworms should be more extensively tested in order to ascertain the dose-rates at

which dependable action may be expected from the best of them, and to ascertain the best conditions for their administration.

3. Tests of Chenopodium and Mixtures Containing Chenopodium

Chenopodium appears to have been used as an anthelmintic by the American Indians before Columbus discovered America, and to have been used in rural districts subsequently for some years before becoming established in professional use in human medicine in the United States. It was introduced into human medicine in Europe by Baumler, in 1881, and seems to have been carefully studied by Bruening, who published a report on it in 1906. In veterinary medicine it appears to have been first reported on for worms in dogs by French, in 1896. Dr. F. R. Whipple noted, in 1923, that chenopodium was recommended for worms in horses by Dr. L. A. Merillat in lectures at the McKillip Veterinary College in Chicago, in 1899, and in an editorial comment on Whipple's note it is stated that Dr. M. H. McKillip used this drug for worms in horses as early as 1879.

Critical tests of chenopodium for worms in dogs were reported by Hall and Foster, in 1918, and by Hall and Wigdor, in 1919. The dose-rate for removing ascarids from dogs was reported by Hall, in 1917, as 0.1 cc per kilogram of live weight of dog, or 1 cc for a dog of average size, 10 kilos (22 pounds) being taken as the average weight. Evidence establishing this dose-rate has been published by Hall and his colleagues at Washington and Detroit, but the additional evidence published here serves to confirm the previous work and to add to it in several respects.

The following protocols give the data in this order: number of dog; weight of dog; size of dose of anthelmintic, or dose-rate; purgative and amount; worms passed; worms present postmortem; efficacy of drug stated as percentage of worms passed of total number of worms originally present.

Chenopodium Alone

Dog 1; 9.5 kgm.; 15 minims in soft capsules (ca. 0.1 cc p. k.); castor oil (probably 1 ounce), 2½ hours later; 14 ascarids; postmortem, no worms; 100 per cent for ascarids.

Dog 18; 21 kilos; 30 minims in soft capsules (ca. 0.1 cc p. k.); castor oil, 15 cc; no worms; postmortem, no worms; no conclusions.

Dog 22; 9 kilos; 15 minims in soft capsules (ca. 0.1 cc p. k.); castor oil, 30 cc; 2 ascarids, 6 hookworms; postmortem, 9 whipworms; 100 per cent for ascarids and hookworms, 0 per cent for whipworms.

Dog 68; 14 kilos; 20 minims in soft capsules (ca. 0.1 cc p. k.); castor oil, ten 20-minim soft capsules; 10 whipworms; postmortem, no worms; 100 per cent for whipworms.

Dog 69; 6 kilos; 10 minims in soft capsules (ca. 0.1 cc p. k.); castor oil, twenty 20-minim capsules; 2 ascarids; postmortem, no worms; 100 per cent for ascarids.

Dog 269; 8 kilos; 0.1 cc p. k.; castor oil, 1 ounce; 6 ascarids; postmortem, 16 hookworms; 100 per cent for ascarids, 0 per cent for hookworms.

Dog 347; 11 kilos; three 10-minim talc-shellac-coated soft capsules, all of which were subsequently vomited, 2 opened and 1 unopened; 29 ascarids; postmortem, 1 whipworm and 2 *Dipylidium*; 100 per cent for ascarids, 0 per cent for whipworms and tapeworms. In none of our experiments have we taken any precaution to prevent dogs vomiting; in practically all cases, chenopodium is effective against ascarids, as in this case, regardless of vomiting.

Dog 16; 8.5 kilos; 25 minims in soft capsules; elaterin, 1/10 grain, no worms; postmortem, 1 *Dipylidium*; 0 per cent for tapeworms.

Dog 25; 14.5 kilos; 25 minims in soft capsules; elaterin, 1/10 grain; 42 ascarids; postmortem, over 100 *Dipylidium*; 100 per cent for ascarids, 0 per cent for tapeworms.

Dog 9; 7.5 kilos; 25 minims in soft capsules; elaterin, 1/10 grain, and castor oil, 6 cc; 2 ascarids; postmortem, 4 ascarids; 33 per cent for ascarids; dog dead, second day (gastroenteritis).

Dog 236; 9 kilos; 0.1 cc p. k.; no purgative; 4 ascarids; postmortem, 20 *Taenia*; 100 per cent for ascarids, 0 per cent for tapeworms.

Dog 336; 9.5 kilos; 12 minims; cascarin, 3 grains; 9 ascarids, 6 hookworms; postmortem, no worms; 100 per cent for ascarids and hookworms.

Dog 313; 15 kilos; three 10-minim capsules at half-hour intervals, total 30 minims; half-hour after last dose, magnesium sulphate, 15 grams; 4 whipworms; for postmortem, see *Chenopodium Fractions*.

Chenopodium Fractions

Various fractions of chenopodium were reported on by Hall and Hamilton in 1918. Subsequent writers have taken exception to their findings and it is possible that there were defects in the distillation apparatus which prevented them from obtaining definite fractions of which some contained ascaridol and others did not. They found the lighter fractions, those distilling off at the lower temperatures and presumably composed largely of hydrocarbons, most effective against ascarids; the experiments reported in our first paper in this series indicate that certain hydrocarbons, as well as the dioxid, ascaridol, may be effective in removing ascarids from dogs. These experiments are some not reported by Hall and Hamilton, but carried out by us at a later date.

Dog 313; 15 kilos; light fraction No. 13 (distilling up to 125° C. at 30 mm. of mercury), 0.1 cc p. k.; castor oil, 30 cc; 328 whipworms in next three days, most of them (286) two days after treatment; postmortem, 498 whipworms (163 in cecum and 335 in colon); 40 per cent for whipworms. The number of whipworms originally present include four removed by chenopodium alone, reported in the series above, and totals the unusually large number of 830.

Dog 315; 17 kilos; light fraction No. 13, 0.1 cc p. k. in dry sodium bicarbonate; calomel, 5 grains; 1 ascarid; postmortem, 1 whipworm, 3 *Dipylidium*; 100 per cent for ascarids, 0 per cent for whipworms and tapeworms. This dog was a pup with distemper, a poor subject for anthelmintic treatment, but it survived treatment without evident damage. It is possible that sodium bicarbonate, a not uncommon ingredient in anthelmintic preparations, has some protective effect, possibly in combating acidosis. This point deserves investigation.

Dog 271; 11 kilos; light fraction No. 13, 0. 1 cc p. k.; castor oil, 30 cc; 4 ascarids, 4 hookworms; postmortem, 6 hookworms; 100 per cent for ascarids, 40 per cent for hookworms.

Dog 259; 10 kilos; light fraction No. 13, 0.1 cc p. k.; castor oil, 30 cc; 1 ascarid; postmortem, no worms; 100 per cent for ascarids.

Dog 264; 15 kilos; light fraction No. 13, 0.1 cc p. k.; castor oil, 30 cc; 10 hookworms; postmortem, 5 hookworms; 67 per cent for hookworms.

Dog 268; 10 kilos; light fraction No. 13, 0.1 cc p. k.; 2 hookworms; postmortem, 13 hookworms, 6 whipworms; 13 per cent for hookworms, 0 per cent for whipworms.

Dog 273; 12.5 kilos; light fraction No. 13, 0.1 cc p. k. on three successive days; castor oil, 30 cc; 2 hookworms; postmortem, 74 hookworms, 17 whipworms; 3 per cent for hookworms, 0 per cent for whipworms.

Cat 2; 2 kilos; light fraction No. 13, 0.1 cc p. k.; castor oil, 25 cc; 15 ascarids; postmortem, no worms; 100 per cent for ascarids.

Dog 266; 9.5 kilos; heavy fraction No. 14 (not distilling over at or below 125° C. at 30 mm. of mercury), 0.1 cc p. k.; castor oil, 30 cc; 2 ascarids; postmortem, 20 *Dipylidium*; 100 per cent for ascarids, 0 per cent for tapeworms.

Dog 261; 9.5 kilos; fraction No. 20 (residue after violent reaction on distilling), 0.1 cc p. k.; castor oil, 30 cc; no worms; postmortem, 5 ascarids; 0 per cent for ascarids. Presumably the effective constituents of the drug were destroyed in the heat action.

Dog 267; 17.5 kilos; fraction No. 22 (treated to remove cineol), 0.1 cc p. k.; castor oil, 30 cc; 2 ascarids; postmortem, 15 ascarids, 8 hookworms, 14 whipworms, 19 *Dipylidium*; 12 per cent for ascarids, 0 per cent for hookworms, whipworms, and tapeworms.

Chenopodium and Thymol

Dog 276; 20 kilos; chenopodium, 2 cc, and thymol, 0.5 gm.; magnesium sulphate, 2 drams, in simple syrup, two hours later; 1 hookworm; postmortem, 181 hookworms, 299 whipworms, 94 *Didylidium*; about 0.5 per cent for hookworms, 0 per cent for whipworms and tapeworms.

Chenopodium, Oleoresin of Male Fern and Kamala

Dog 14; 14.5 kilos; chenopodium, 25 minims in soft capsules, oleoresin of male fern, 35 minims, and kamala, 20 grains; 9 hookworms; postmortem, no worms; 100 per cent for hookworms.

Dog 17; 8.5 kilos; same dose as above; 20 ascarids; postmortem, 6 *Dipylidium*; 100 per cent for ascarids; 0 per cent for tapeworms.

Chenopodium, Oleoresin of Male Fern and Chloroform

Dog 150; 9.5 kilos; chenopodium, 1 cc, chloroform, 3 cc, and oleoresin of male fern, 4 cc; castor oil, 30 cc; no worms; postmortem, 1 whipworm; 0 per cent for whipworms.

Dog 146; 14.5 kilos; same as above; purgative as above; 1 ascarid, 17 hookworms; postmortem, 1 hookworm; 100 per cent for ascarids, 94 per cent for hookworms.

Dog 143; 13 kilos; chenopodium, 1 cc, chloroform, 2 cc, and oleoresin of male fern, 4 cc; castor oil, 30 cc; 8 hookworms; postmortem, 5 hookworms; 62 per cent for hookworms.

Dog 141; 10 kilos; same as for dog 143; purgative as above; no worms; postmortem, 1 whipworm, 1 *Dipylidium*; 0 per cent for whipworms and tapeworms.

Dog 139; 12.5 kilos; same as for dog 143; purgative as above; 2 whipworms, 1 *Dipylidium*; postmortem, 9 whipworms; 10 per cent for whipworms, 100 per cent for tapeworms.

Dog 138; 14 kilos; same as for dog 143; purgative as above; no worms; postmortem, 3 *Didylidium*, 6 mm. long; apparently 0 per cent for tapeworms, but not definitely so, considering length of worms at postmortem on fifth day after treatment.

Dog 137; 10.5 kilos; same as for dog 143; purgative as above; 1 ascarid; postmortem, no worms; 100 per cent for ascarids.

Summary

An examination of the tests of chenopodium alone or of chenopodium fractions shows that in the case of a fraction undergoing a violent reaction during distillation the drug was entirely ineffective against ascarids in one case, and that after the treatment of chenopodium to remove cineol the product was only 12 per cent effective against ascarids in one case. Leaving these cases out of consideration as not representative of the action of chenopodium, the drug, given in most cases at approximately 0.1 cc per kilogram of weight of dog, removed all of the ascarids from 13 of 14 infested dogs. In the case of the fourteenth dog (9) the drug was given in double the therapeutic dose-rate, at 0.2 cc per kilogram, in soft capsules, with 1/10 grain elaterin and 6 cc castor oil; the dog died the second day after treatment and had a pronounced gastroenteritis. The conditions here are somewhat unusual, but it is to be expected that a partial failure as in this case, the removal of only 33 per cent of the ascarids, or even a total failure, will occur in perhaps one case out of 20, as a result of some unusual condition not always ascertainable in advance of treatment.

The lack of dependable efficacy of chenopodium for hookworms in dogs is illustrated by the experiments with chenopodium and its fractions. Disregarding the fraction treated to remove cineol, which removed no worms, the efficacy indicated by the percentage of hookworms removed in cases where these worms were present is as follows: 100, 100, 67, 40, 13, 3 and 0. These results are decidedly inferior to those obtained with carbon tetrachlorid or with the drug recently proposed by Hall and Shillinger, tetrachlorethylene.

The results in removing whipworms show the variation and uncertainty shown by anthelmintics in general against these worms. Disregarding the fraction treated to remove cineol, which removed no whipworms, the treatment removed all the whipworms in one case; part of them, 40 per cent, in one case; and failed to remove any in five cases.

Chenopodium has no value in removing tapeworms from dogs.

In a single test chenopodium and thymol failed to remove whipworms and tapeworms, and removed only one of 182 hookworms. Very little can be concluded with safety from this single test.

Chenopodium, oleoresin of male fern and kamala removed all

the hookworms from one dog, all the ascarids from a second, and failed to remove any tapeworms from the second dog. As this combination would be indicated only if successful in removing tapeworms as well as roundworms, there appears to be nothing gained by using it, although the failure to remove tapeworms in a single test does not constitute a case against the combination.

Chenopodium, oleoresin of male fern and chloroform removed all the ascarids from two infested dogs, 94 and 62 per cent of the hookworms from two infested dogs, 100 and 0 per cent of the tapeworms from two infested dogs, and 10, 0 and 0 per cent of the whipworms from three infested dogs, with another questionable, but indicated, failure against whipworms. Since better results can be obtained with other drugs in removing hookworms and tapeworms, and equally good results in removing ascarids, there appears to be nothing to be gained by using this combination.

4. Tests of Miscellaneous Substances

In the course of our investigations we made tests, sometimes one and sometimes several, of substances which for one reason or another promised to be useful or concerning which we desired information as to possible anthelmintic value. When these initial tests showed that nothing of value could be expected from a substance no further tests were made. The information obtained, while usually of a negative nature as regards the value of the things tested, appears to be worth recording, since information to the effect that a thing is not of value may save other investigators from wasting time in repeating the investigations and affords a definite basis for answering many questions as to the probable value of such substances. Such questions are often asked by veterinarians, commercial houses, etc.

Latex of the Fig, Ficus Laurifolia

Calmette and Breton, in 1905, state that doliarine, used in Brazil as an anthelmintic, is a ferment prepared from the latex of *Ficus doliara*. The latex of *Ficus laurifolia* was recommended by Berrio, in 1911, and by Mouatt-Biggs, in 1915, for the removal of whipworms from man. It was given a critical test on dogs by Hall and Foster, who reported, in 1918, that a sample showing evidence of deterioriation entirely failed to remove worms from dogs, and that a subsequent sample, apparently in good condition, removed 9 of 11 ascarids, 1 of 33 hookworms,

1 of 50 whipworms, and none of several tapeworms (*Dipylidium* sp.). Henao and Villa (1917) state that the latex is the only effective remedy for whipworms. Lecaza (1917) states that it is of value only for whipworm treatment and has the defect of causing colitis. Balfour (1920) states that investigations indicate that this latex has only a mechanical action in entangling and removing worms.

Spruit (1921) says the latex is safe and useful, removing whipworms from 57 per cent of his cases. He gave doses of 16 cc; Berrio gave 25 to 30 grams, and Mouatt-Biggs gave 10 to 40 grams. Montoya (1922) gives doses of 15 to 45 grams and states that one dose may cure, but that usually it must be repeated. He states that the drug usually causes no symptoms, but that it may cause cramp, delirium, sudden and intolerable urticaria, syncope, vertigo, convulsions, rectal and vesical tenesmus, partial suppression of urine and other milder symptoms, such as colic, nausea and vomiting. The symptoms usually disappear in a few hours. Dr. S. M. Lambert has informed one of us (Hall) that he knows of one case of death following the use of the latex. Balfour (1922) states that the latex ferments readily and if used fresh keeps only four or five days; preserved with an equal amount of chloroform, it could be kept for 34 days in an ice-box without fermenting. Balfour thinks that probably it can be used to advantage only in countries where the fig grows. Hall and Shillinger (1925) have surmised that the efficacy of the latex against whipworms is correlated with its bulk, as the large doses given may tend to ensure its entry into the cecum.

Our own tests of the latex were made with a sample shipped direct from South America and arriving in apparently good condition. The data on these and our other tests are given in the following order: number of dog; weight of dog in kilos (kilograms); dose or dose-rate; purgative and amount; worms passed; worms present postmortem; per cent of efficacy of drug (equivalent to per cent of worms passed calculated on total originally present as a base). The tests were as follows:

Dog 62; 7 kilos; 40 cc; no purgative; no worms; postmortem, 1 hookworm, 12 whipworms, 1 *Dipylidium* sp.; 0 per cent for hookworms, whipworms and tapeworms.

Dog 63; 8 kilos; 45 cc; no purgative; no worms; postmortem, 1 ascarid; 0 per cent for ascarids.

Dog 53; 8 kilos; 40 cc; no purgative; no worms next day and dose repeated this day; castor oil, 1 ounce; 1 ascarid, 5 *Dipylidium* sp.; postmortem, 4 ascarids, 5 whipworms, 200 *Dipylidium* sp.; 20 per cent for ascarids, 2. 5 per

cent for tapeworms, 0 per cent for whipworms. This dog died five days after the second treatment and showed a hemorrhagic enteritis postmortem; it can not be stated with any certainty that the drug was the cause of death, but in connection with the symptoms reported by Montoya, there is the evident possibility that this was the case.

Our tests confirm the findings of Hall and Foster to the effect that the drug as obtained in the United States after shipment from South America without special precautions for keeping it fresh is relatively inactive, having very feeble anthelmintic properties. It was entirely ineffective against whipworms in our tests, and removed only 1 of 50 in the tests by Hall and Foster, and it is for whipworms that the drug is specially recommended. The tests in this country, with practically negative results, tell nothing about the value of the fresh latex.

Pyrethrum

Dog 217; 6.5 kilos; 1 gram pyrethrum powder; no purgative; no worms in four days; then 1 gram of a pyrethrum extract equivalent to the residue from 5.26 cc of a fluidextract of pyrethrum; no purgative; 3 whipworms; postmortem, 3 whipworms, 39 *Didylidium* sp.; 50 per cent for whipworms, 0 per cent for tapeworms.

Dog 233; 9 kilos; 0.21 grains of an oil, the total amount extracted from 12 grains of pyrethrum; castor oil, 30 cc; 1 ascarid; postmortem, 3 ascarids, 6 *Didylidium* sp.; 25 per cent for ascarids, 0 per cent for tapeworms.

These experiments indicate that little of value is to be expected from pyrethrum as an anthelmintic.

Betanaphthol

The betanaphthol was dissolved in 10 cc of 95 per cent alcohol and given by stomach-tube, followed by 10 cc of water. It is soluble in 95 per cent alcohol, but is thrown out of solution in a form equivalent to a fine powder when water is added in amount equivalent to the amount of alcohol solvent. This is merely a way of getting a fine division of the material; aside from this use of alcohol, alcohol is contraindicated in connection with this anthelmintic and many others.

Dog 190; 11 kilos; 2 grams; castor oil, 30 cc; no worms; postmortem, 8 hookworms, 7 whipworms, 1 *Dipylidium* sp.; 0 per cent for hookworms, whipworms, and tapeworms.

Caius and Mhaskar (1921; 1923) regard betanaphthol as a very good drug for removing hookworms from man and rank it as one of four equally effective drugs for this purpose, the drugs being betanaphthol, thymol, chenopodium and carbon tetrachlorid. While this one test with a resultant total failure to remove hookworms does not give adequate evidence as to the value of betanaphthol for removing hookworms from dogs, there is abundant evidence to show that there is no such uni-

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form value for these drugs for removing hookworms. Carbon tetrachlorid has been shown by Hall and Shillinger, and others to be almost 100 per cent effective for removing hookworms from dogs; chenopodium has been shown by Hall and his collaborators (Foster, Widgor, Hamilton) to be much less effective than carbon tetrachlorid; thymol has been shown by Hall and Foster and by Gaiger to be even less effective than chenopodium; and the one experiment reported here indicates that betanaphthol, while it might make a better showing in further experiments, promises nothing of value. Tetrachlorethylene, recently proposed as a drug for the removal of hookworms by Hall and Shillinger, is also superior to chenopodium, thymol and betanaphthol, so far as its efficacy against the dog hookworm is concerned, and is comparable to carbon tetrachlorid.

Carbon Bisulphid

In 1884, Perroncito and Bosso recommended carbon bisulphid for the removal of bots from horses. In 1907 Taar recommended the same drug for the removal of ascarids from horses. The efficacy of carbon bisulphid in removing bots was established in critical tests by Hall (1917), Hall, Smead and Wolf (1919), Hall and Avery (1919) and Wright (1921), and its efficacy in removing ascarids from horses was established in the same way by Hall, Smead and Wolf (1919), and Wright (1921). The horse ascarid appears to be rather resistant to chenopodium; according to Hall, Wilson and Wigdor (1918). On this evidence carbon bisulphid might be expected to be quite effective against ascarids in the dog. To test this we carried out the following experiment with it:

Dog 188; 9 kilos; 1 cc; castor oil, 30 cc; 3 ascarids; postmortem, 25 ascarids, 9 hookworms, 4 whipworms, 1 *Dipylidium* sp.; 11 per cent for ascarids, 0 per cent for hookworms, whipworms and tapeworms.

These results appear to promise little, but one should keep in mind that Hall and Avery (1919) found that the simultaneous administration of oil and carbon bisulphid diminished the efficacy of carbon bisulphid for bots, and further tests might show the same diminution of efficacy against ascarids.

Chloretone

Chloretone is trichlortertiarybutyl alcohol, $C_4H_7OCl_3$. In view of its chlorin content and general relation to the chlorinated hydrocarbons which have been found effective against hookworms, such as carbon tetrachlorid and tetrachlorethylene, it

might be assumed that this drug would have some value in removing hookworms. One test of the drug was made.

Dog 285; 8.5 kilos; 1 gram; castor oil, 30 cc; no worms; postmortem, 2 hookworms; 0 per cent for hookworms.

The dog was drowsy and snoring, but not asleep, a half-hour after treatment. There is the theoretical possibility that castor oil simultaneously administered might diminish the efficacy of chloretone and we would not feel warranted in saying that chloretone was devoid of anthelmintic action. without further tests.

Fowler's Solution

Various forms of arsenic have been recommended as anthelmintics, especially in veterinary medicine, but they are apparently overrated in this connection. In the form of sodium arsenite and mixed with copper sulphate it appears to have established value in the treatment of stomach-worm disease in sheep and is used in this form in South Africa. Aside from this there is a lack of dependable and accurate evidence in favor of arsenic as an anthelmintic. We tested it in the form of Fowler's solution on two dogs.

Dog 211; 10.5 kilos; solution diluted 1:8 and given daily, except Sundays, in amounts of 0.5 to 2 cc for a total of 18 doses, equal to 20.5 cc, in 20 days; 1 ascarid on eighteenth day; postmortem, 1 ascarid, 25 hookworms, 34 whipworms; 50 per cent for ascarids, 0 per cent for hookworms and whipworms.

Dog 216; not weighed; same treatment as above for total of 20 doses, equal to 22 cc, in 22 days; 1 hookworm on nineteenth day, 1 *Taenia* on twenty-first day, and 1 *Taenia* on twenty-second day; postmortem, 2 hookworms, 24 whipworms, 13 *Taenia* and 18 *Dipylidium*; 33 per cent for hookworms, 14 per cent for *Taenia*, and 0 per cent for whipworms and *Dipylidium*.

The above findings show that the anthelmintic value of Fowler's solution as given is very slight indeed. No worms were passed until the eighteenth day at the earliest, and in general anthelmintic results should follow a reliable drug in the course of a day or two. The most that we could claim for the drug as an anthelmintic is that when used for other reasons, as an alterative or tonic, it may give additional service by removing a few worms.

Barium Sulphate

Dog 326; 10 kilos; 1 gram; no worms; postmortem, 30 ascarids, 3 hookworms; 0 per cent for ascarids and hookworms.

There appears to be no theoretical reason why barium sulphate should be effective as an anthelmintic and we are willing to accept the results of this one test as indicating that the drug is of no value in this connection.

Mineral Oil

Dog 134; not weighed; 30 cc daily for seven of eight consecutive days; no other purgative; 1 ascarid on sixth day; postmortem, 4 ascarids, 10 whipworms, 10 flukes (*Alaria americana*); 20 per cent for ascarids, 0 per cent for whipworms and flukes.

On theoretical grounds one might suppose that a mineral oil might be injurious to worms in some way; actually it appears to have very little effect, assuming that the passage of one ascarid was due to the oil and not merely an incidental occurrence.

Cresols

Cresols are often recommended for worms in swine and sheep. We tested a standardized, emulsified, cresol stock-dip as follows:

Hog 335; ca. 50 pounds; one-half teaspoonful in one pint water daily for 33 days; no worms; postmortem given below.

Hog 336; ca. 50 pounds; same treatment; no worms; postmortem given below.

Hog 337; ca. 50 pounds; same treatment; no worms; postmortem given below.

On postmortem these hogs had 1, 2 and 16 ascarids, and 0, 1 and 3 nodular worms.

Dog 54; 16 kilos; 3 cc; castor oil, 30 cc; 4 ascarids; postmortem, 66 ascarids, 31 whipworms; 6 per cent for ascarids, 0 per cent for whipworms.

Dog 57; 12 kilos; 0.6 cc; castor oil, 30 cc; no worms; postmortem, no worms; no conclusions.

Dog 66; 4 kilos; 0.2 cc daily for total of nine doses in ten days; 1 *Dipylidium*; dog dead on tenth day; postmortem, 1 ascarid; 100 per cent for tapeworms, 0 per cent for ascarids. The treatment killed the dog.

The tests show that cresols usually have very little effect on worms; the postmortem examinations showed that the cresols had a serious effect on the digestive tract. The evidence indicates that the cresols are unsuitable and unsatisfactory as anthelmintics.

Summary

The latex of the fig, *Ficus laurifolia*, after shipment to the United States, has not proven a satisfactory anthelmintic; this affords no evidence as to its value in the countries where the tree grows.

Pyrethrum does not appear to be of value as an anthelmintic.

Betanaphthol is apparently distinctly inferior to carbon tetrachlorid and tetrachlorethylene for removing hookworms from dogs.

Carbon bisulphid does not appear to be of value as an anthelmintic for dogs.

One test of chloretone does not show that it has anthelmintic value. While the drug does not promise to be of value in this connection there are theoretical reasons why it should receive

further test in connection with the supposedly anthelmintic value of chlorin in hydrocarbon compounds.

Fowler's solution appears to have a very slight anthelmintic value which develops very slowly. It can not be recommended as an anthelmintic.

Barium sulphate seems to have no anthelmintic value.

Mineral oil in repeated doses has little or no value in removing worms.

The cresols have a very slight anthelmintic action in most cases, and act as gastrointestinal irritants to such an extent that their use is not safe.

EASTERN STATES TUBERCULOSIS CONFERENCE

The seventh annual Eastern States Conference on the Eradication of Tuberculosis in Live Stock will be held at Burlington, Vermont, Tuesday and Wednesday, June 22-23, 1926.

The Conference will be held under the auspices of the U. S. Bureau of Animal Industry, the Vermont State Department of Agriculture and the Vermont Veterinary Medical Association. Dr. J. R. Mohler, Chief, Bureau of Animal Industry, Dr. James A. Kiernan, Chief, Tuberculosis Eradication Division, and other assistants at Washington, as well as the inspectors-in-charge and their assistants, and the commissioners of agriculture of the several New England and North Atlantic states will be present and help out on the program. Many nationally known speakers will discuss the tuberculosis campaign from both the economic and public health standpoint. These meetings generally draw around 400 professional men, breeders and public health officials and the public are cordially invited to attend the meeting. Headquarters will be at the Vermont and Van Ness hotels, and the gymnasium in the University of Vermont, with a seating capacity of 1200 people, will be used for the meetings.

Lexington! Let's Go!

Down in Tennessee

Tourist—What's that beast?
Native—That's a razorback hawg, suh.
"What's he rubbing himself on the tree for?"
"Jest stropping hisself suh, jest stropping hisself."

—*Tit-Bits.*

SOME DEVELOPMENTS IN CANINE DISTEMPER PROPHYLAXIS

By

D. I. SKIDMORE, *Chief, Division of Virus-Serum Control*

and

J. S. BUCKLEY, *Chief, Pathological Division*

U. S. Bureau of Animal Industry

Washington, D. C.

The dog's life is beset with diverse and numberless hazards, with distemper easily outranking all others. While the dog thus pays for his privilege of living, the dog breeder, the fancier, the veterinarian, and all who are interested economically in this animal are confronted quite constantly with vexatious problems and periodically are compelled themselves to lead a hectic life.

Perhaps at no time in recent years has distemper occupied a more important position in the minds of investigators and friends of the dog than it has during the past year. The universality of this animal and the rather phenomenal increase in the breeding of it have been important factors in this situation.

The fact that distemper takes an enormous toll of dogs, which makes it difficult and expensive for breeders to conduct their business economically and successfully, has resulted in practically a world-wide effort to accumulate funds to be used in further study of the disease and the development of effective preventive measures. Committees in this and other countries have been organized to facilitate this work and a number of institutions are now attempting to find some solution of the problems.

Greene, of the University of Minnesota, has reported some of his discoveries as to the cause of distemper in foxes, which indicated to him that a similar agent may be responsible, at least in part, for distemper in dogs.

Early in 1925, a commercial firm represented to the Bureau of Animal Industry that it had made some interesting and important discoveries in connection with the prevention of canine distemper and that it had developed a very effective preventive treatment which it desired the Bureau to test. It was obvious at once, from the character of the treatment and the strong claims made for

*Received for publication, February 27, 1926.

its effectiveness, that it would attract unusual interest, and should merit this if found to be as represented. It was recognized, also, that anything which offered greater promise of effective prevention than known lines of treatment, which admittedly have not proved as satisfactory as is to be desired, should be accepted as progress in the right direction. The firm also signified its intention of applying for a patent covering its process and for a license to prepare and market its products on a large scale.

The Virus-Serum-Toxin Law provides that no worthless, contaminated, dangerous, or harmful biologic product intended for use in the treatment of domestic animals shall be marketed outside of the state in which it is prepared. It also provides that no biologic product intended for such use shall be marketed through the channels of interstate commerce, unless it has been prepared under a veterinary license.

In the JOURNAL of the American Veterinary Medical Association for August, 1925, Lockhart, Ray, and Barbee announced that they had developed an effective preventive for canine dis-

TABLE I—*Tests of sample A. Dogs treated with serum and antigen, 4-9-25; exposed to distempered dogs, 4-17-25*

DOGS	TREATMENT	RESULTS: INITIAL DATE OF SICKNESS (SYMPTOMS OF DISTEMPER) ONLY IS SHOWN	NO DIST. SYMPS.	DISTEMPER	DIED OF DIST.	SYMP. OTHER THAN DIST.	NOT PROTECTED
8		Remained well. R. 8-21	8	0	0	0	0
1		Symptoms, 5-2. K. 8-21	0	1	0	0	1
1	Serum	Symptoms, 4-29. D. 5-7	0	1	1	0	1
1		Symptoms, 5-2. D. 5-8	0	1	1	0	1
1	and	Symptoms, died, 8-8	0	1	1	0	1
1		Symptoms, 6-17. K. 8-21	0	1	0	0	1
1	Antigen	Symptoms, 6-17. D. 7-30	0	1	1	0	1
1		No symptoms noted. D. 6-4	0	1	1	0	1
1		Symptoms, 4-20. D. 5-5*	–	–	–	–	–
16*			8	7	5	0	7
							SUSCEPTIBLE
3		Remained well. R. 8-21	3	0	0	0	0
1		Injured. D. 5-5	1	0	0	1	0
1	None	Pneumonia, 4-29. D. 5-2	0	1	1	0	1
1		Distemper, 5-11. D. 5-20	0	1	1	0	1
1	(Controls)	Distemper, 5-14. D. 5-18	0	1	1	0	1
1		Distemper, 5-14. D. 5-28	0	1	1	0	1
2		Distemper, 5-5. K. 8-21	0	2	0	0	2
10			4	6	4	1	6

R. = Released. K. = Killed. D. = Died.
*Disregarded. This dog showed symptoms three days after treatment and before exposure (in the test) to cases of distemper and is therefore regarded as infected prior to treatment.

Four of the group of 10 untreated dogs, in the test of sample A, although constantly exposed to distemper during the test period, did not develop this disease. This indicates that only 9 of the 15 (16-1) treated dogs were susceptible when treatment was applied. (10 : 4 :: 15 : x, or 6 immunes. 15-6 =9 nonimmunes.) Since 7 of the 9 susceptible dogs were not protected, this indicates that the remaining 2 may have been protected by the treatment and the efficiency of the sample, as shown by this test, is 22.2% (2÷9=22.2%).

temper which they termed "Sero-toxylin No. 1" and "Sero-toxylin No. 2." The data thus made available to the public indicated that the products possessed a very high efficiency. Although the announcement did not describe the products fully, the Bureau was furnished with complete information as to the methods of preparation before it consented to issue a license and preliminary to testing them. It was apparent from this information that the products could be so prepared as not to be contaminated, dangerous, or harmful. Therefore, the chief object of testing them was to determine, if possible, whether, when used as recommended, they might be worthless, or whether they could be expected to be of value in preventing distemper. In all, four tests were made of a like number of samples or batches

TABLE II—*Tests of sample B. Dogs treated with serum and antigen at time of exposure*

DOGS	TREATMENT	DATE*	RESULTS: INITIAL DATE OF SICKNESS (SYMPTOMS OF DISTEMPER) ONLY IS SHOWN	NO DIST. SYMPS.	DISTEMPER	DIED OF DIST.	SYMP. OTHER THAN DIST.	NOT PROTECTED
1			Remained well. R. 8-21	1	0	0	0	0
1		6-8	Distemper, 8-3. K. 8-21	0	1	0	0	1
1	Serum		Distemper, 8-6. K. 8-21	0	1	0	0	1
2	and		Distemper, 7-13. K. 8-21	0	2	0	0	2
1		6-11	Died in fit, 7-21†	0	1	0	0	1
1	Antigen		Distemper, 8-1. K. 8-21	0	1	0	0	1
2		6-25	Remained well. R. 8-21	2	0	0	0	0
1			Distemper, 7-31. K. 8-21	0	1	0	0	1
10				3	7	0	0	7
								SUSCEPTIBLE
1			Distemper, 7-13. K. 8-21	0	1	0	0	1
1		6-8	Rabies. D. 6-19‡	–	–	–	–	–
1			Distemper, 7-31. K. 8-21	0	1	0	0	1
1	None		Distemper, 7-13. K. 8-31	0	1	0	0	1
1		6-11	Distemper, 7-8. D. 7-24	0	1	1	0	1
1			Rabies. D. 7-28	1	0	0	1	0
1	(Controls)		Distemper, 7-15. K. 8-21	0	1	0	0	1
1		6-25	Distemper, 7-4. K. 8-21	0	1	0	0	1
1			Distemper, 7-6. K. 8-21	0	1	0	0	1
9‡				1	7	1	1	7

R. = Released. K. = Killed. D. = Died.
*Treated and exposed same day. All dates in 1925.
†No other symptoms of distemper.
‡Disregarded. This dog died of rabies eleven days after exposure and without having shown distemper symptoms.

One of the group of eight (9-1) untreated dogs, in the test of sample B, although exposed as were those in the previous test, did not develop distemper. This indicates that either 8 or 9 treated dogs were susceptible at time of treatment. (8 : 1 :: 10 : x, or 1.25 immunes. 10-1=9 nonimmunes, or 10-2=8 nonimmunes.) If 9 of the 10 treated dogs were susceptible when treatment was applied and seven were not protected, the test indicates that the remaining two may have been protected by the treatment and the efficiency of the sample tested is 22.2% (2÷9=22.2%.) However, if only 8 of the 10 treated dogs were susceptible when treated and 7 were not protected, the indication would be that the one remaining dog was protected by the treatment and the efficiency of the sample tested is 12.5% (1÷8=12.5%).

of serum, with results shown in tables I to IV, inclusive. Three of these tests were conducted exclusively under the control of the Bureau, while another was made under close supervision of an authorized Bureau employe. While the results obtained were not so striking or conclusive as hoped for, it is believed that they give some indication of what the products may be expected to accomplish.

The findings indicated that the products properly could not be regarded as "worthless," under the provisions of the Virus-Serum-Toxic Law. When the tests are judged as fairly as humanly possible, from the limited number of animals used, and as liberally as fairness requires, it is apparent that they demonstrate some value for the products and, therefore, that they are eligible to be licensed under the law. Accordingly a license was issued for canine distemper antigen and anti-canine distemper serum, and not for "Sero-toxylin No. 1" and "No. 2," respectively, since the latter do not adequately describe them and are merely coined terms, which are not satisfactory for licensed products.

The announcement of Lockhart and his co-workers not only stimulated interest in distemper prevention, but brought numerous inquiries to the Bureau, in which it was sought to learn whether the claims made in the announcement and in an advertising way were justified. In view of this situation the results of the tests which were conducted and supervised by the Bureau

TABLE III—*Tests of sample C. Dogs treated with serum and antigen and exposed to distemper 1 days, 9-11-25*

Dogs	Treatment	Results: Initial Date of Sickness (Symptoms of Distemper) Only is Shown	No. Dist. Symps.	Distemper	Died of Dist.	Symp. other than Dist.	Not Protected
2		Remained well. R. 10-16	2	0	0	0	0
1	Serum and Antigen	Distemper, 10-7. Recovered and released, 10-16	0	1	0	0	1
1		Distemper, 9-20. D. 9-26	0	1	1	0	1
1		Distemper, 9-18. D. 9-23	0	1	1	0	1
5			2	3	2	0	3
							Susceptible
2	None (Controls)	Remained well. R. 10-16	2	0	0	0	0
1		Distemper, 9-23. D. 10-5	0	1	1	0	1
1		Distemper, 9-20. D. 9-28	0	1	1	0	1
4			2	2	2	0	2

R. = Released. D. = Died.

Two of the group of four untreated dogs, in the test of sample C, although exposed as were those in the previous tests, did not develop distemper. This indicates that either 2 or 3 of the treated dogs were susceptible when treated. (4 : 2 :: 5 : x, or 2.5 immunes. 5-2=3 nonimmunes, or 5-3=2 nonimmunes.) Inasmuch as 3 (60%) of the 5 treated dogs developed distemper as compared with 50% in the controls, no efficiency of sample C is indicated in the results of this test.

TABLE IV—*Tests of sample D (serum and antigen) and normal dog serum, administered at time of exposure*

DOGS	TREATMENT	DATE*	RESULTS: INITIAL DATE OF SICKNESS (SYMPTOMS OF DISTEMPER) ONLY IS SHOWN	NO DIST. SYMPS.	DISTEMPER	DIED OF DIST.	SYMP. OTHER THAN DIST.	NOT PROTECTED
2		8-6	Remained well. R. 9-26	2	0	0	0	0
1		8-8	Remained well. R. 9-26	1	0	0	0	0
1			Injured eye. D. 9-18†	–	–	–	–	–
1			Distemper, 8-22. D. 9-22	0	1	1	0	1
1			Distemper, 8-19. D. 9-8	0	1	1	0	1
1	Serum		Distemper, 8-24. D. 9-13	0	1	1	0	1
1			Distemper, 8-24. D. 9-11	0	1	1	0	1
1			Distemper, 8-19. D. 9-7	0	1	1	0	1
1			Distemper, 8-21 Recovered and released, 9-26	0	1	0	0	1
1	and		Distemper, 8-21. D. 9-15	0	1	1	0	1
1		8-6	Distemper, 8-21. D. 9-6	0	1	1	0	1
1			Distemper, 8-24. D. 9-25	0	1	1	0	1
1			No symptoms noted. D. 8-19	0	1	1	0	1
1			Distemper, 8-20. D. 8-24	0	1	1	0	1
1			No symptoms noted. D. 8-18	0	1	1	0	1
1			No symptoms noted. D. 8-17	0	1	1	0	1
1	Antigen		Distemper, 8-19. Recovered and released, 9-26	0	1	0	0	1
1		8-8	Distemper, 8-27. Recovered and released, 9-26	0	1	0	0	1
1			Distemper, 8-25. D. 9-8	0	1	1	0	1
20†				3	16	13	0	16
1			No symptoms noted. D. 8-24	0	1	1		
1	Normal	8-6	Distemper, 8-20. D. 9-8	0	1	1		
1			Distemper, 8-20. D. 8-24	0	1	1		
1	Dog		No symptoms noted. D. 8-18	0	1	1		
1	Serum	8-8	No symptoms noted. D. 8-24	0	1	1		
5				0	5	5		
								SUSCEPTIBLE
1			Elev. temp. 8-17. D. 8-18	0	1	1	0	1
1			Distemper, 8-19. D. 9-13	0	1	1	0	1
2			Distemper, 8-19. D. 8-24	0	2	2	0	2
1	None	8-6	Distemper, 8-19. D. 8-20	0	1	1	0	1
1			Distemper, 8-19. D. 9-2	0	1	1	0	1
1			Distemper, 8-19. D. 8-22	0	1	1	0	1
1	(Controls)		No symptoms noted. D. 8-17	0	1	1	0	1
1		8-8	Distemper, 8-21. D. 9-2	0	1	1	0	1
1		8-12	Distemper, 8-19. D. 8-24	0	1	1	0	1
10				0	10	10	0	10

R. = Released. D. = Died.

*Treated and exposed the same day. All dates in 1925.

†Disregarded. The total number of treated dogs charged to the test is reduced from 20 to 19, because of the condition of this animal.

All of the untreated dogs, in the test of sample D, developed distemper as a result of direct contact with dogs sick of the disease and, therefore, all of the treated dogs are regarded as susceptible to distemper at the time of treatment. Since 16 of the 19 treated dogs were not protected, this indicates that the remaining 3 may have been protected by the product and the efficiency of the sample, as shown by the test, is 15.8% (3÷19=15.8%).

are published herewith, in order that all who are interested may place there upon their own interpretation. If the products possess merit, as these tests tend to indicate, even better results should be experienced in practice, even though the dogs which are treated therewith are exposed to known cases of distemper. The alert veterinarian in practice, therefore, will take advantage of every favorable opportunity for further testing the merits of the treatment, by comparing its effect upon treated groups of dogs with conditions observed in untreated groups, both of which are exposed to distemper in the same way and are otherwise alike. The relatively small number of animals used in all of these tests should not be overlooked, nor should the fact be overlooked that the group of dogs which received normal dog serum all succumbed to distemper. The results in the normal-serum group indicate that no sustaining effect was obtained from such serum, since the dogs treated therewith died as promptly as did the controls when exposed to cases of distemper.

In each of the accompanying tables the ratio between the total number of dogs in the untreated group (controls), and those of this same group that failed to develop distemper, is used to determine the number in the treated group of the same test that may be regarded as immune or nonsusceptible to the disease before being injected with serum and antigen, and as a basis for arriving at the immunizing efficiency of the different samples. For example, it will be noted that in table I, four of the ten untreated dogs did not develop distemper after long exposure to the disease. It may be assumed, therefore, that relatively a like number of treated dogs were immune and nonimmune, respectively, when treatment was applied. (10 : 4 :: 15 : x, or 6 immunes. 15-6 = 9 nonimmunes.) Thus there were only nine of the fifteen treated animals which properly can be regarded as susceptible to distemper, the other six being immune and having remained well for this reason and not from the effects of treatment.

TABLE V—*Summary of data in tables I, II, III and IV*

Product Tested	Treated Dogs					Untreated Dogs (Controls)			
	Received Serum and Antigen		Results in the Number assumed to be Susceptible			Used	Charged to Tests	Developed Distemper	Immune
	Total No.	Charged to Tests	Total	Developed Distemper	Remained Well				
Sample A	16	15	9	7 (77.8%)	2 (22.2%)	10	10	6	4
Sample B	10	10	9	7 (77.8%)	2 (22.2%)	9	8	7	1
Sample C	5	5	3	3 (100%)	0 (00 %)	4	4	2	2
Sample D	20	19	19	16 (84.2%)	3 (15.8%)	10	10	10	0
Gr. Total	51	49	40	33 (82.5%)	7 (17.5%)	33	32	25	7

DISCUSSION OF RESULTS

Lockhart and his co-workers report an experiment in which 258 dogs, between the ages of three and ten months, were used and show that of 166 treated dogs only 3 (1.8%) developed distemper after exposure to dogs sick with this disease, whereas, out of 92 controls 81 (88+ %) developed distemper. Although it was thought that all of the dogs selected were susceptible to distemper, these figures indicate that about 12 per cent of the controls were immune, before they were entered in the experiment. For purposes of comparison it may be assumed, therefore, that a similar rate of immunity existed in the treated dogs, which points to about twenty of this group being immune when the treatment was applied. (92 : 11 :: 166 : 19.8, or 20 immunes. 166-20 = 146 nonimmunes.) Since only 3 of the 146 nonimmune or susceptible dogs developed distemper, while 143 remained well, this indicates an efficiency for the product of about 98 per cent. (143 ÷ 146 = 97.9%.)

Anti-hog cholera serum, when used simultaneously with hog cholera virus, for immunizing swine against cholera, is one of the most dependable biologic products prepared for the treatment of either man or animal, but it can not be said to be 100 per cent efficient, as commonly used. Therefore, the report of Lockhart and his associates suggests that the prophylactic, as they found it, has an efficiency of 98 per cent, which is comparable to one of the most dependable biologics products known.

The figures for their experiment are shown here to permit results reported by them to be compared with those obtained in testing samples A, B, C and D, for which the indicated efficiency of the prophylactic ranged from 0 to 22.2 per cent.

USE OF MILK SHOWS INCREASE

The per capita consumption of milk is increasing, according to the latest data announced by the U. S. Department of Agriculture.

The consumption of ice cream in the U. S. has increased from 1.04 gallons a year per person in 1910 to 2.8 gallons in 1925. Per capita consumption in 1924 was 2.5 gallons. The total quantity of ice cream consumed last year is estimated at 322,729,000 gallons, compared with 285,550,000 gallons in 1924, and 260,000,000 gallons in 1920.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

DIGESTIVE DISTURBANCES IN SERUM-PRODUCING HORSES AS AN INDIRECT RESULT OF MINERAL DEFICIENCY

By OSCAR GLUECK

Lederle Antitoxin Laboratories, Pearl River, N. Y.

The frequent bleeding of serum horses, which approximates about 24 liters of blood monthly, results in a mineral deficiency in these animals, caused by the withdrawal of the inorganic salts contained in the blood so withdrawn. The disease occurring in horses of the Kirgizian prairies, and which is described under the name of kungata or saburra, represents essentially the same condition, inasmuch as it develops from the ingestion of food deficient in mineral constituents.

A similar mineral deficiency was observed among the horses during the World War, especially on the Macedonian front, in the Balkans, which caused great losses among the animals. The mineral deficiency in the horses is manifested by their inclination to lick and gnaw mortar, sand, and earth, and by swallowing these foreign substances, the digestive disturbances follow.

Foreign substances ingested by these animals, lodge in the stomach and intestines, where they sometimes form masses of four to ten pounds in weight; other times they form encrusted, cylinder-like masses in the small intestines, interfering with the absorption of the food.

A mineral deficiency similar to that which occurs as a result of improper feeding develops also in the serum-producing animal, following the frequent bleeding, and the subsequent inability of the animal to regenerate the lost salts. It is observed that such animals show by instinct their desire to make up such a deficiency by eating dirt, sand, and other inorganic matter in the paddock, and in this manner take the undesirable foreign material into their digestive tract. Such animals, which frequently can be readily recognized by dirt and earth adhering to the mouth, develop symptoms of inappetence, emaciation,

and very often colic, associated with constipation and sometimes followed by diarrhea. The feces are sometimes intermixed with sandy substances or dirt. Other times, the appetite is not changed, but emaciation develops, and the disease terminates in complete exhaustion and death.

The constant bleeding of the serum horses depletes them, to a considerable extent, of their required mineral salts, inasmuch as the blood contains considerable amounts of inorganic salts, especially such containing sodium, iron, potassium, lime, magnesium, phosphorus, and chlorin. In consideration of the fact that these inorganic substances are being continuously withdrawn from the serum-producing animals, it appears evident that the depraved appetite in this type of animal is primarily due to such a deficiency and represents an effort on the part of the animal to make up this deficiency.

The ingested foreign material naturally has resulted in a considerable annoyance and even a considerable number of deaths in the serum-producing horses. The writer has kept careful data on 160 of such horses, for a period of seven months. Accurate records on the number of digestive disturbances were kept. The number of such cases was out of proportion to the number of cases of colic occurring in horses kept under normal conditions.

To correct the mineral deficiency in these horses, a mixture of various salts was prepared, of which each horse received two ounces daily, mixed with the food. The mixture consisted of 33 pounds of bicarbonate of soda, 8 pounds of chlorid of lime, 17 pounds of sodium phosphate, one pound of potassium nitrate, and two-thirds of a pound of pulverized iron. The horses took the food containing this mixture with great relish. After the first month of feeding this preparation, the number of cases of colics decreased materially, and no cases occurred during the second month, and during the last five months only one case of colic was observed among all the horses, this animal dying during the attack. The autopsy revealed an obstruction of the mesenteric artery, due to an infestation with sclerostomes. Nor have we been able to observe, in any of the horses, any depraved appetite, and therefore it is evident that the feeding of the mineral mixture eliminated the desire for the foreign substances.

The importance of mineral deficiency in the different species of animals is being given considerable attention at this time, and, no doubt, veterinarians should always give this problem due

consideration and serious attention. In the efforts to obtain maximum production and yields from the animal body, we should not lose sight of the fact that such production is always associated with a depletion of the mineral matter, which must be replaced, whether in the form of a properly balanced ration or by actually feeding mineral salts.

BRACKEN POISONING IN HORSES*

By C. H. WETTER, *Princeton, Minn.*

Bracken poisoning is a condition with which I have come in contact repeatedly, but in horses only. This disease has been observed in cattle by Storrar, in 1893, who attributed the condition to the food being of a highly indigestible nature and by McGowan, in 1915, who expressed the opinion that all these disease conditions arose from modification of the bacillus of hemorrhagic septicemia.

In 1920, Drs. W. A. Hagan and J. K. Bosshart, of the New York State Veterinary College at Cornell University, described a disease of cattle which they were unable to diagnose and called it a fatal undiagnosed disease of cattle. Drs. Hagan and Bosshart contended that this disease affected cattle only, but other authors agree in that it affects horses also, with which I also agree. Having had no experience with this disease in cattle, I will not attempt to dwell on it regarding cattle.

Bracken poisoning is usually observed in the winter months, when hay containing large amounts of fern are being fed with practically no roughage; for example, oat straw. A horse will eat good oat straw in preference to fern hay. It has been my experience that only certain meadows in my community seem to harbor the toxic fern. Some years, usually those that are dry and hot, seem to give it a more toxic power or action.

Symptoms: Uncertain gait; loss of equilibrium, especially upon backing; unthriftiness; and, when not attended to, the animal ceases to eat and falls down, unable to get up and showing marked nervousness. Temperature ranges from 100° F. to 104-5° F. Pulse is normal at onset and greatly accelerated before death.

Diagnosis: Presence of bracken in hay.

Prognosis: Favorable, if treated early; recovery usually taking a week or ten days.

*Presented at the twenty-ninth annual meeting of the Minnesota State Veterinary Medical Association, St. Paul, Minn., January 14-15, 1926.

Treatment: Remove cause (fern hay). Give patient purgative, to flush the bowels thoroughly, and stimulants or a tonic.

Lesions: About the only noticeable lesions on postmortem examination are hemorrhages under the skin, varying in size. The heart and serous membranes are usually petechiated.

CASE REPORT

I was called to see two sick horses, one being supported in slings, the other lying on his side, kicking, champing his mouth, and trying to get up but unable to do so. He was apparently in great pain, and I was told that he had been lying there for a week. Both horses had large pus sacs on their hips and shoulders, from being down so long. The general condition, I thought, warranted slaughter, which was done.

At first glance I suspected bracken in the hay and, upon examining the hay in the manger, I found it to be mostly fern. The farmer then informed me he was feeding his drivers whatever the work-team would not eat. However, they showed no clinical symptoms. This was on Sunday. I advised him to notify me immediately if they showed unsteadiness. Tuesday I was informed both horses seemed to stagger and were hard to back. One-half pound of Glauber salts and a grain of arecolin was given. All hay containing fern was taken away and the bowels kept loose. Recovery was made in a few days.

A FIELD EXPERIENCE WITH INTERNAL PARASITES OF CHICKENS

By JOHN PATTERSON, *Hedrick, Iowa*

To begin with, the writer wishes it understood that this is the experience of a practitioner in the field, treating farm flocks under range conditions, where it is next to impossible to check results with the same scientific accuracy available under laboratory conditions. The only evidence of a successful treatment is the restoration of the flock to a healthy condition. Whether or not the treatment is 100 per cent efficient in removing parasites, the writer does not know. Success must be measured by satisfaction on the part of the owner of the flock.

In 1924, thirteen flocks, composed of 3575 chicks, were treated. In 1925, twenty flocks, composed of 6850 chicks were treated, making a total of 10,425 chicks in thirty-three flocks. It is interesting to note that practically all persons, who received treatment

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for their flocks in 1924, returned for the same line of treatment in 1925. The additional flocks treated in 1925, over those treated in 1924, were the property of relatives of 1924 clients or their neighbors.

Infestations of ascarids and coccidia are by far the most common forms of parasitism in fowls in the southeastern section of Iowa. The two groups of parasites seem to go hand in hand, and it is very seldom that one is found without the other, especially after the chicks reach the feathering-out stage. No effort will be made to discuss the symptoms or pathology of the conditions.

In 1923, we began treatment of this condition with quinin sulphate alone, when treating simple coccidiosis, and betanaphthol alone for the ascarids. Experience soon taught of the copartnership of the parasites, and the two drugs were thereafter given in all cases. Even in uncomplicated coccidiosis, better results seem to be had when betanaphthol is given along with quinin. With the exception of one flock, the combined quinin-bethanaphthol treatment was used on these 10,425 chicks with highly satisfactory results. The owners and all concerned were well pleased.

It should be understood that a diagnosis was never made nor a treatment prescribed without first making a postmortem examination on one or more typically sick chicks from the flock.

Considering the fact that conditions are never satisfactory for individual treatment, the flocks are always treated *en masse*. Number 00 capsules are filled with the powdered drugs—quinin sulphate in clear capsules and betanaphthol in pink capsules. The owner is instructed to give the contents of a pink capsule to every twenty baby chicks on the first day, the contents of a clear capsule to every twenty chicks on the second day, alternating until four doses of each drug have been given. This, of course, takes eight days in all. If he has 100 chicks, he will use five capsules each day. The amount of pressure used in filling the capsules will determine the amount of the contents but, under ordinary pressure, the 00 capsule will hold eight grains of quinin. If the chicks weigh around one to two pounds, the dose is increased to about one-half grain to the chick, or one capsule to every fifteen chicks.

Betanaphthol is of about the same density as quinin and will fill the capsule in the same manner. It is advisable, for the beginner, to weigh the first hundred capsules which he fills. Mix

thoroughly with dry mash, then moisten just enough to make crumbly before feeding. If a drop of Epsom salt is given in the mash on the day preceding treatment, and on the day following, the results will be uniformly better.

In three different flocks, tapeworms were also found. Whether they were removed or not the writer does not know. However, the flock showed marked improvement and did not show any symptoms of parasitism during the succeeding season. This line of treatment seems to be almost 100 per cent efficient, when viewed from a practical standpoint, and will bear a trial. The writer claims no originality for the treatment, or the method of giving it. It was first suggested by Dr. Charles Murray, of the Department of Veterinary Investigation, Iowa State College.

BOVINE ABORTION DISEASE

By N. S. MAYO, *Chicago, Ill.*

In making a brief survey regarding the etiology of bovine abortion disease, it would appear that a number of research workers are inclined to attribute all outbreaks of abortion in bovines to the *Bacterium abortus* (Bang). That this organism is the most important etiological factor is admitted, but much research is needed along other lines. Smith has shown that *Vibrio foetus* is responsible for some outbreaks of abortion; Gilman and Birch, of Cornell, and T. Smith have also reported a mold, and it has also been shown that *B. melitensis* experimentally inoculated will cause abortion. Traum reports outbreaks of abortion disease in cattle without demonstrable etiological agent. It is possible that other known pathological or saprophytic organisms may be of importance in causing abortion and some authorities are inclined to think that nutritional deficiency, particularly of calcium, phosphorus, or iodin, may be an important etiological factor.

Serious outbreaks of abortion in cows have occurred, where none of the aborting animals has responded to the agglutination test, and herds have been reported where, over a considerable period, a larger percentage of abortions occurred among cows that did not respond to the agglutination test than among reactors. These facts suggest that there are important etiological factors in abortion disease of cattle other than the *Bacterium abortus* Bang).

Chemotherapy has made remarkable progress within the past few years and while its application to abortion disease in cattle would be empirical with our present knowledge of the etiological agents, chemotherapy should be given a test. Among the agents that may be of value intravenously are the arsphenamins, the flavines, and the organic mercurials.

AN IMPROVED BOVINE SPECULUM AND CERVICAL FORCEPS

By E. R. Carlson

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East Lansing, Mich.

In my work with Dr. E. T. Hallman, on the diseases of the reproductive organs of cattle, I have felt the need of an improved vaginal speculum for the examination of the cervix in the diagnosis of pregnancy and clinical examination in sterility. Our idea of the requirements of a satisfactory speculum was that the speculum should be so constructed that it might be easily introduced into the vagina and be easily and thoroughly cleansed after use; that the light should be a part of the speculum, so that one hand of the operator might be free with which to use instruments; that the speculum should be of sufficient size to permit thorough examination of the vagina and cervix and the use of cervical and dressing forceps through it; and that it should be non-breakable. The accompanying photograph illustrates my efforts to meet these requirements.

The speculum is constructed of the segments of two brass pipes, nickel-plated, one fitting snugly into the other but sufficiently loose to permit one to rotate within the other and to permit its removal for cleaning. The segment of the inner tube is provided with a short groove to hold the light carrier, which is easily removed for cleansing. The light used is a standard 1½-volt lamp with dry battery. The two segments are matched, so that when the handle of each is in line with the other the two lower edges lack about one-fourth inch of being in contact. This feature is provided to prevent pinching the mucosa of the vagina, as the inner segment is rotated to close the speculum. This opening also provides drainage in case there is considerable exudate in the vagina that would otherwise collect in the specu-

Received for publication, April 3, 1926.

lum. The speculum is made in two sizes: one, 1½ inches in diameter and 15 inches in length, and the other, 2 inches in diameter and 18 inches in length. The smaller one was constructed to be used in heifers.

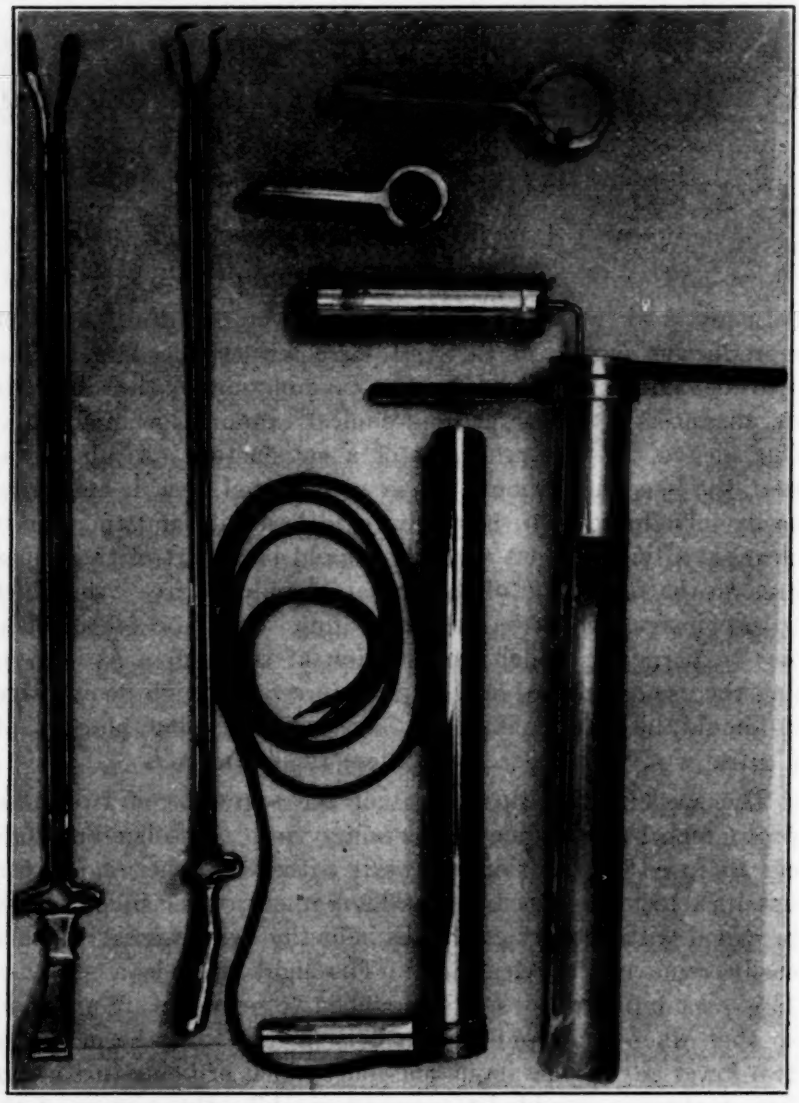


FIG. 1. Improved bovine speculum and cervical forceps.

We find this speculum of great value, not only in the examination of the vagina and cervix and the treatment of the cervix by swabbing through it, but also in permitting of the placing of the

cervical forceps on the cervix to retract the uterus for rectal examination without the necessity of introducing the hand into the vagina. To accomplish this we have designed a cervical forceps with detachable handle. That can be operated through the speculum and, after grasping the cervix, the speculum may be removed from the vagina leaving the forceps attached.

This forceps is the one shown in the accompanying illustration, having the same jaws as those of the Knowles uterine forceps. It is opened and closed by a rotary movement and, by means of a sliding-ring lock, may be securely locked in a closed position. The handle is detachable. When in position it may be unlocked instantly, by a simple rotary lock. The two arms of the forceps are held together by a continuous-pin lock that is easily and quickly removed for cleansing the forceps.

The illustration also shows another type of forceps that operates in the same way but has pronged jaws.

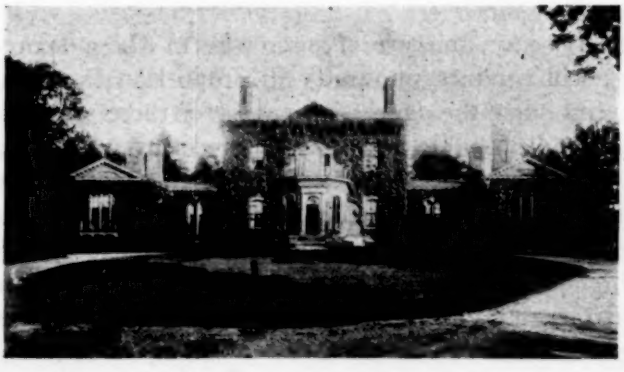
Lexington! Let's Go!

SKIN INFECTIONS OF DOGS

In treating itching skin diseases of dogs it is important that the treatment be applied to the whole surface of the body, particularly the hind feet. Dogs bite and scratch the itching areas and are liable to distribute the infection to other parts of the body by the mouth parts and hind feet.

—N. S. M.

PLAN NOW FOR LEXINGTON



"Ashland," home of Henry Clay, on East Main Street, Lexington.

COMMUNICATION

ANTHRAX AGGRESSIN

TO THE EDITOR:

In the March, 1926, issue of the JOURNAL, the editorial commenting on anthrax aggressin suggests a comparison between the immunity produced by the injection of spore vaccine and that produced by the injection of aggressin. The comparison infers that the swellings which follow the injections of spore vaccine contain aggressins and that immunization by these aggressins should be just as effective as the injection of aggressin produced in other animals.

Such an inference is not in accord with the basic principles of true aggressin-production, as outlined in the work of Bail and others. While it is possible that a certain amount of aggressive substance may be produced in such swellings, its actual aggressive value is limited, because it has been found that in order to produce aggressins of maximum potency, bacteria of the highest virulence must be injected and such injection must produce rapidly fatal infection. "In general, the production of these aggressins goes on more actively, and they are produced in greater quantities, the greater the struggle between the bacteria and the body cells" (Kolmer). In fatal infections, where the struggle is won by the bacteria, the aggressin accumulation is much greater and of greater activity than in the mild struggle between the attenuated spores, whose aggressive nature is weakened, and the body cells, in which the latter are supreme. The whole theory of aggressins is based entirely upon the question of virulence and, accordingly, the virulence of any organism is in direct ratio to the amount of active aggressin it is capable of producing. It is certainly not reasonable then to suppose that avirulent spores are capable of secreting any appreciable amount of active aggressin.

Naturally, any amount of aggressin in these spore-vaccine swellings will produce immunity in proportion to the aggressin present, but since the aggressive nature of these spores has been weakened and probably largely destroyed through their attenuation, it is obvious that any amount of aggressive substance they would be capable of producing would be very small and with little aggressive action, hence "the direct inoculation of aggressins is much more reliable, being productive of a true immunity" (Bail-Citron).

C. E. SALSBERY.

Kansas City, Mo., March 19, 1926.

REVIEWS

DISEASES OF THE DOG AND THEIR TREATMENT. George Müller, Professor and Director of the Clinic for Small Animals at the Veterinary High School at Dresden, and Alexander Glass, Professor of Canine Medicine in the School of Veterinary Medicine of the University of Pennsylvania. 5th edition, revised and enlarged. xvi+655 pages, with 255 figures in the text, several of which are in color. Alexander Eger, Chicago, 1926. Cloth, $6.00.

Veterinarians have eagerly awaited the new edition of this old-established book. No reasons need be mentioned to account for the desire shown by practically all veterinary practitioners for information concerning canine diseases.

It is difficult to review a book of this kind critically, for the reason that it combines material contributed by the author, which, of course, was written from the German point of view, as well as new material reflecting the views of the translator, essentially American. Undoubtedly the fact that much of the book comes under the former category will account for numerous seeming omissions which tend to make the careful reader feel that certain portions of the text are not strictly up to date. For example, in enumerating the various therapeutic agents employed for removing tapeworms, the use of areca nut is discussed, with no mention of its active principle—arecolin—now so extensively used by veterinarians in America.

In the discussion of the etiology of distemper, the author leans toward the opinion that the disease is caused by an ultramicroscopic virus, rather than any of the several visible organisms described by various investigators. In short, the author believes that the true cause of distemper remains to be revealed. This view is reflected in the rather unfavorable opinion expressed concerning the value of the specific biological products that have been offered for both preventive and curative use.

The subject of rabies is well presented and the conservatism of either the author or the translator is indicated in what is said concerning the one-injection method of vaccinating against rabies. It is stated: "The evidence that this is a reliable method and based on facts is wanting, unless we quote some statistics that were made in Japan in some towns and villages, and there

is a question, at the present time, whether it does bring immunity and how long will the immunity last. Until there is more can be said of its benefits and facts can be stated that are based on time and experience, it will not be wise to advocate its use."

The book is profusely illustrated, there being several full-page reproductions in color. Those depicting stomacace and "rhachitis" are of questionable value and the money spent for reproducing these in color might have been well spent for making new cuts for some of the illustrations, many of the cuts used showing unmistakable signs of wear.

Although this is the fifth edition, the book contains many typographical errors and shows other evidences of not having beed carefully edited. Both the old and the new spelling for numerous words appear throughout the book, for example, cocaine (p. 641) and cocain (p. 625). Cubic centimeter is abbreviated "ccm." on p. 138, "C. C." on p. 399, and "c.c." on p. 448. The names of common drugs and diseases are frequently capitalized, whereas the generic names of parasites in some cases are not. Speaking of therapeutic sera, it is stated (p. 641) that at present they are still in a state of "evolution." Carbon tetrachlorid is referred to as being administed in "flexible" capsules (p. 143).

We are inclined to overlook any shortcomings the book may have, for the reason that this is a time when every possible encouragement should be given both authors and publishers of veterinary books. There is a distinct need for high-grade veterinary text-books at the present time, to keep pace with the rapid advances being made in all branches of veterinary science. Publishers have been reluctant to put new veterinary books on the market, because those already published were not selling up to expectations. Nevertheless, there is no excuse for publishing books teeming with errors of orthography, diction, punctuation and grammar, several of which have made their appearance recently.

THE DOG ENCYCLOPEDIA. William Lewis Judy, editor of Dog World. 184 pages. Judy Publishing Co., Chicago, 1925.

As stated in the introduction, "This is the dog's day and now all days are dog days." Even though automotive power has displaced the horse in the affections of many men, and even though suggestions have been made that the cow may be similarly displaced by some ingenious lactiferous mechanical contrivance,

the dog will remain forever as the companion of man. Occupying different strata in the animal kingdom, there nevertheless is a sort of indissoluble kinship which exists between a man and his dog, an unalloyed friendship that is as strong in one as in the other, although necessarily differently displayed. Even the absence of the spoken-word means of communication does not weaken the bond between the two. Perhaps it is strengthened, for the reason that misunderstandings rarely occur.

With the tremendous increase in the popularity of the dog there came a demand for a book, containing, within small compass, up-to-date, authoritative information on breeds of dogs, definitions of dog terms, directions concerning breeding, feeding, care, management, exhibiting, judging, shipping, pedigrees, registration, etc., etc. The author has succeeded admirably in meeting just such a demand. He has not ventured too far in the field of veterinary medicine in discussing the half-dozen or so diseases listed in the book. Exception could be taken to his statement that "almost any worm medicine purchasable at the drug store is satisfactory," or his statement suggesting that very few cases of rabies occur in the dog.

With such a fund of dog information now conveniently available, we really see no reason for the continuance of the so-called veterinary columns found in practically all dog magazines.

THE DOBERMAN PINSCHER. William Sydney Schmidt. 62 pages. Judy Publishing Co., Chicago, 1926.

This is a monograph on a breed of dogs that has become quite popular in this country, although practically unknown before the late war. It is believed to be the most authoritative work on the subject and undoubtedly will contribute further to the popularity of this breed. The book contains chapters on the origin and history of the breed, its development, official standards, a discussion of these standards, breeding, training, showing and judging, care, etc. The concluding chapter is a critical review, accompanied by photographs, of the leading Dobermans of America.

ABSTRACT

STUDIES ON THE ETIOLOGY OF DISTEMPER IN FOXES. R. G. Green and H. O. Halvorson. Jour. Bact., xi (1926), 2.

Epizootics have occurred on silver fox ranches entailing a mortality as high as 70 per cent. The most common autopsy

findings have been pneumonia, intestinal lesions, and an enlarged spleen, with a general toxic effect on all organs.

In some epizootics, pneumonia occurred only occasionally, with the upper respiratory tract normal. The blood, abdominal organs and central nervous system were found to contain the virus. Filtration experiments showed the infective agent to be non-filtrable. The most constant bacteriological finding was the presence of members of the *Salmonella* group. They appeared in pure culture in most ranch foxes. They occurred in pure culture almost always when the disease was transmitted by injection of infective material.

Pure cultures of *Salmonella* obtained from foxes were pathogenic and would cause death in from twelve to thirty days, producing the typical disease. After injection, the organism can be recovered in pure culture at autopsy.

G. W. R.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

MINNESOTANS ADOPT RESOLUTION

The following resolution was adopted by the Minnesota State Veterinary Medical Association, at the twenty-ninth annual meeting, held in Minneapolis, January 14-15, 1926.

WHEREAS, Federal, state and municipal health service organizations recognize that milk for human consumption should be produced only from healthy cattle, and

WHEREAS, The health of cattle can be determined only by the application of the tuberculin test and other scientific tests, together with physical examinations, made by competent qualified veterinarians; therefore be it

Resolved, That the Minnesota State Veterinary Medical Association recommend that city ordinances, enacted to preserve the public health and which provide for the inspection of milk and milk products, shall require the inspection of dairies and dairy cattle to be made only by duly qualified and competent veterinarians, and further be it

Resolved, That the Public Health and Marine Hospital Service be respectfully requested to consider amending their model milk ordinance to require that the inspection of the dairy cattle be made by competent qualified veterinarians, and further be it

Resolved, That a copy of these resolutions be furnished to Surgeon General Hugh S. Cumming, Public Health and Marine Hospital Service, Washington, D. C., and a copy be sent to the secretary of the American Veterinary Medical Association.

The resolution was prompted by the fact the the Public Health and Marine Hospital Service had drawn up a model ordinance in which the veterinarian was not recognized as being the logical man for inspecting milk.

Lexington! Let's Go!

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Regular Army

Colonel W. G. Turner is relieved from duty at the Purchasing and Breeding Headquarters, Kansas City, Mo., effective on or about May 10, 1926, and directed to report to the Surgeon General at Washington, D. C., for duty in his office, relieving Lt. Colonel J. A. McKinnon.

Lt. Colonel J. A. McKinnon is relieved from duty in the Office of the Surgeon General, effective June 1, 1926, and assigned to duty as station veterinarian, Presidio of San Francisco, Calif., and as port veterinarian, Port of San Francisco, and to duty with the Medical Department at Headquarters, 9th Corps Area.

Captain Frank B. Steinkolk is relieved from duty with the 1st Cavalry Division, Fort Bliss, Texas, and directed to report to the Commanding Officer, Fort Sheridan, Ill., for duty not later than June 30, 1926.

Reserve Corps

New Acceptances

First Lieutenant:
Wilson, Willis....Dayton, Washington.
Second Lieutenant:
Jeffers, Boyd.....206 E. Second St., Lexington, Ky.

Promotions

Second Lieutenant John Henry Wirtz, Box 848, Oklahoma City, Okla., promoted to grade of First Lieutenant.

Separations

Captain Cornelius C. Weeks, Saratoga Hotel, Caldwell, Idaho. Died July 30, 1925.

Changes of Address

Second Lieutenant Lawrence D. Barrett to 715 Arch St., N. S., Pittsburgh, Pa.
Second Lieutenant Guy Maxey Parrish to 320 Agricultural Bldg., Raleigh, N. C.
First Lieutenant Lawrence Glen Combs, to House 356, Ancon, C. Z.
First Lieutenant H. M. Knoernschild, to 320 Agriculture Bldg., Raleigh, N. C.
First Lieutenant Wm. D. Mason, to 2440 Rossville Blvd., Chattanooga, Tenn.
First Lieutenant Wm. Stark Trigg, to 25 Live Stock Exchange Bldg., Buffalo, New York.

TRAINING OF BRANCH ASSIGNMENT VETERINARY RESERVE OFFICERS

It is proposed to hold training camps for officers of the Medical Department Reserve at the following places for periods of fifteen (15) days, as indicated:

Carlisle Barracks, Pa., June 16 to 30 and July 4 to 18, 1926.

Fort Snelling, Minnesota, June 13 to 27 and July 4 to 18, 1926.

Camp Lewis, Washington, June 13 to 27 and July 4 to 18, 1926.

Fitzsimons General Hospital, Denver, Colorado, July 4 to 18, 1926.

Funds have been allotted for the training of officers of the Medical Department Reserve assigned to the *Branch Assignment Group* under the direction of The Surgeon General. It is planned to give officers of the various sections of the Medical Department Reserve Corps, who can accept training during one of these periods, the advantage of full field instruction, including tactics and technic of operation of divisional medical units. During the training period troops will be available to demonstrate the general and selective operation of these units, and it is proposed to make the training intimate and practical, presenting to the Reserve officer the opportunity to exercise command and put into execution plans simulating the actual conditions which will obtain should he be called upon in an emergency.

It is hoped that it may be possible for the full quota of veterinary officers to take advantage of the splendid opportunity which a camp affords for training and as a further indication of their support of the medical program for the national defense.

Officers of the *Branch Assignment Group* who indicate their desire to accept training during a period mentioned will, when ordered to active duty, receive mileage from their home to camps and return and the pay and allowances of their grade while on active duty. Officers assigned to active duty will be sent to the camp most economical in mileage in order to distribute the mileage allowance to the benefit of the greatest number.

Veterinary officers desiring this training should apply to The Surgeon General, using the form previously distributed for this purpose. In case the prescribed form is not available, applications may be forwarded by ordinary letter. While the officer's preference as to date of assignment is desired and will be carefully considered, the assignments must be made within the maximum number to be accommodated at each training period. The Appropriations Act prohibits the assignment to active duty, for training, for more than one 15-day period in each fiscal year.

Only officers in the *Branch Assignment Group* are under the direct supervision of The Surgeon General. The training of officers in the Territorial Assignment Group is provided by their respective Corps Area Commanders and is usually given in connection with the training of the various units to which these officers are attached.

In the Heart of the Blue Grass
August 17-18-19-20, 1926

AMERICAN VETERINARY MEDICAL ASSOCIATION

Minutes of Conference Held by Committee on Policy

The Committee on Policy of the A. V. M. A. held a conference at the La Salle Hotel, Chicago, Ill., the evening of December 1, 1925, as authorized by a resolution adopted at the meeting in Portland the previous summer. To this conference invitations were sent to all veterinarians in charge of instruction in veterinary subjects in the various agricultural colleges in the United States and Canada.

Roll-call showed the following to be present: Members of the Committee on Policy, Drs. Cahill, chairman, Way, Adams, Jacob and Hoskins; members of the Executive Board, Drs. Munce, Conrad, White and Stange; agricultural college veterinarians, Drs. S. J. Schilling, Ark.; G. H. Hart, Calif.; I. E. Newsom, Colo.; C. C. Palmer, Del.; R. A. Whiting, Ind.; W. W. Dimock, Ky.; Harry Morris, La.; C. P. Fitch, Minn.; R. V. Rafnel, Miss.; E. M. Pickens, Md.; J. W. Connaway and O. S. Crisler, Mo.; Edward Records, Nev.; A. F. Schalk, N. D.; I. D. Wilson, Va.; F. B. Hadley and B. A. Beach, Wis.; and Cecil Elder, Wyo. Other veterinarians present included Dr. D. H. Udall, of Cornell University; Dr. W. H. Welch, secretary of the Illinois State Veterinary Medical Association; and Dr. E. R. Steel, secretary of the Iowa Veterinary Association.

Chairman Cahill called the conference to order at 7:30 p. m. and immediately proceeded to outline the purposes of the conference. It was stated, as the opinion of the Committee on Policy, that most veterinarians teaching in agricultural colleges were making an honest effort to teach only those subjects which were in conformity with the policy adopted by the A. V. M. A. It was pointed out, however, that in a few instances the veterinary subjects which were being taught to agricultural students were not in accord with the A. V. M. A. ploicy and would not be properly understood nor utilized by agricultural students and, because of this, could be quite harmful to our animal industry and, at the same time, embarrassing to practicing veterinarians.

It was brought out further that, in spite of the good intentions of veterinarians connected with agricultural colleges, many graduates of these institutions placed interpretations on the subjects which they have been taught entirely different from those intended by these well-meaning veterinarians. This condition has

resulted in these agricultural college graduates believing that they have had a good course in veterinary medicine and are qualified to advise regarding veterinary problems or even to a considerable extent to practice veterinary medicine. Proof of this contention was offered by the reading of the questionnaire-report which had been published by Professor R. L. Griffin, of the Division of Agricultural Education, University of California, entitled "Veterinary Instruction and Practice Among Vocational Teachers of Agriculture." This report was the one extensively referred to in the report presented by the Committee on Policy at the Portland meeting and published in the JOURNAL, October, 1925. The contents of this report reflected the ideas of a large number of teachers of secondary agriculture, as well as the attitude of many county agents. The members of the Committee on Policy were firmly of the opinion that, unless the teaching of veterinary subjects in agricultural colleges was restricted to the elementary subjects specified in our policy, the results of the teaching of more advanced subjects would be exceedingly disastrous to the live stock industry in the end.

Chairman Cahill made it clear that no effort was being made to antagonize any veterinarian connected with an agricultural college, but the publication of Professor Griffin's report, together with certain other events of the past year, made it rather plain that a better understanding was desirable as to the scope of instruction in veterinary subjects which it was necessary and proper to give to agricultural students.

Dr. Jacob addressed the conference and directed attention to the desirability of carefully studying the present situation with a view to bringing about a solution that would be satisfactory and fair to everybody concerned. Dr. Jacob outlined the instruction in veterinary subjects given to agricultural students in the College of Agriculture of the University of Tennessee. He stated that absolutely no clinical work whatever was included in the course given agricultural students, nor was any so-called "first aid" work given. Dr. Jacob stated further that his institution had not published any books or bulletins that would tend to eliminate real professional veterinary service.

Dr. C. P. Fitch reported his private investigation of Professor Griffin and his questionnaire-report. Dr. Fitch was of the opinion that this report had already received considerably more attention than its importance warranted. He said that Pro-

fessor Griffin was not sufficiently well informed in veterinary matters to draw any conclusion on such an important subject.

With reference to the desirability of properly designating so-called courses in veterinary science, Dr. Fitch brought out the fact that a careful study of such courses, now being offered in the various agricultural colleges, indicated that their scope is not accurately reflected in their titles. For example, a course in veterinary medicine may be simply elementary instruction in veterinary physiology and anatomy and such a course may actually contain very little that is definitely related to the art of veterinary practice. Dr. Fitch stated that it was his judgment also that many courses that are being offered are too elementary in character.

Usually an agricultural college student does not take a course in veterinary medicine until either his junior or his senior year, by which time he is capable of comprehending basic instruction in veterinary medicine. If the instruction given is too elementary, the student goes out from the course with the feeling that there is very little to the subject. Dr. Fitch further stated that in his judgment courses in veterinary medicine for agricultural college students should be made as rigid as it is possible to make them, from the standpoint of effective teaching. In this way only would an agricultural student appreciate that he did not have the basic preparation for a complete understanding of the science of veterinary medicine.

Dr. Davis S. White described the courses given at the Ohio State University and incidentally referred to his method of handling correspondence from owners of live stock throughout the State, asking for advice and methods of treatment. Dr. White's general plan is not to attempt to answer any such letters specifically, but to refer the writer to his local veterinarian.

Dr. C. H. Stange spoke on the subject of prerequisites for veterinary courses. At the Iowa State College no student is allowed to register for any of the strictly veterinary courses until they have the prerequisites prescribed for such courses. Dr. Stange compared the respective functions of the animal husbandman and the veterinarian. He stated that the former should be primarily interested in production and the latter in conservation.

President Adams then addressed the conference and very concisely summed up the remarks of the previous speakers. He emphasized the point that veterinarians are not striving to

withhold proper information from the public, but that there is a proper way and form for information of this kind to reach the public, and veterinarians should see to it that the right kind of information reaches the public and in the right way.

Dr. F. B. Hadley stated that it was his belief that very little of the blame for the present situation could properly be traced to agricultural college graduates having received too much veterinary instruction. On the other hand, he believed that county agents and high school teachers, who had not had the proper training in veterinary subjects as agricultural college students, were much more apt to be troublesome meddlers in veterinary matters. Dr. Hadley stated further that the agricultural students who had come under his instruction had been taught to consult their local veterinarians whenever it became necessary to obtain advice, rather than to write to the state veterinarian or the state agricultural college.

Dr. G. H. Hart then gave his version of some of the circumstances surrounding the questionnaire-report of Professor Griffin. Dr. Hart stated that it was his belief that many of the questions asked in the questionnaire had been so worded that the replies very much exaggerated the seriousness of the situation. Dr. Hart further stated that for some unexplained reason Professor Griffin's report had apparently created much more of a disturbance in other parts of the country than in Professor Griffin's own State—California.

Dr. I. D. Wilson stated that he considered it the function of the agricultural college veterinarian to sell the veterinary profession to the owners of live stock. He believed veterinarians connected with agricultural colleges were in a wonderfully strategic position to do just this thing.

Dr. S. J. Schilling urged veterinarians to cultivate the live stock owner. He analyzed the economic situation in which our farmers have found themselves during recent years and explained that many of them had found it necessary to economize in every possible direction and in doing so many of them had decided to dispense with the employment of veterinary services.

Dr. R. A. Whiting stated that he believed the veterinary instruction given at Purdue University to agricultural students did nothing more than to make these men capable animal nurses. However, in the discussion of Dr. Whiting's remarks, it was brought out that his institution conducted clinics and demonstrated major surgical operations for the benefit of agricultural

students. Chairman Cahill pointed out that even if such demonstrations were given merely for "show" purposes, it was open to serious question whether any lasting benefit resulted.

Dr. E. R. Steel spoke in favor of some sort of regulation for the veterinary courses being given in the various agricultural colleges. He was of the opinion that some were not giving enough and others were giving entirely too much.

Dr. B. W. Conrad emphasized the necessity for the proper kind of cooperation, from veterinarians on the one hand and county agents, high school teachers and live stock owners on the other. He pointed out that it very frequently resolves itself into a question of the make-up of the individuals concerned.

Dr. J. W. Connaway stated that, to the best of this knowledge, there was no particular trouble in Missouri at the present time, although there had been instances in the past when the question at issue had been a serious one. He believed that no harm was being done as a result of the veterinary instruction being given the agricultural students attending the University of Missouri.

Secretary Hoskins stated that many complaints had been received from veterinarians relative to the activities of county agents, vocational agriculture teachers and agricultural college veterinarians. He stated that he had made it a practice, whenever a veterinarian complained about the activities of agricultural college veterinarians, to take it up with the men concerned, with a view to getting both parties together for the purpose of having a better understanding and settling the difficulty. He stated further that fewer complaints relative to the activities of county agents were being received, with a corresponding increase in the number of complaints concerning the activities of high school teachers.

Secretary Hoskins further called attention to the great discrepancy in the instruction being given in veterinary subjects by the different agricultural colleges and suggested that it might be advisable to attempt to equalize or standardize these courses, so that, when the graduates of one institution found it necessary to compete with graduates of another college, those who had received little or no veterinary instruction would not find themselves at a disadvantage, nor consider it necessary to ask for the establishment of veterinary courses for their particular benefit, as had been the case in California and brought out by Professor Griffin's report.

Many of the speakers exhibited a tendency to discredit the seriousness of the situation. Others freely voiced the opinion that many practicing veterinarians were to blame for the activities of county agents and high school teachers. Several of the agricultural college veterinarians requested to have referred to them specific instances of veterinary activities upon the part of county agents or high school teachers.

In bringing the conference to a close Chairman Cahill again made it clear that the Committee on Policy had no desire to embarrass the veterinarians connected with our agricultural colleges, but that this conference had been called merely to point out existing conditions, in the hope that the agricultural college veterinarians would voluntarily study the present problem with a view to its early solution.

The conference adjourned without any definite action being taken.

H. PRESTON HOSKINS, *Secretary.*

Financial Report—Dr. M. Jacob, Treasurer
December 31, 1925

Bank balances, June 25, 1925		$ 4,553.06
Less old check cashed		39.91
		4,513.15
Receipts, June 26—December 31, 1925, as per statement		17,425.72
		21,938.87
Expenditures, same period, as per statement		14,557.30
		7,381.57
Placed on time deposit { Journal Fund	$ 3,000.00	
Placed on time deposit { Relief Fund	27.26	3,027.26
		4,354.31
Revolving fund in hands of Dr. Hoskins	$ 500.00	
Loan to Salmon Memorial Fund	300.00	
Loan to Relief Fund	100.00	900.00
		5,254.31
Total amount now on time deposit	$10,592.75	
Bonds (purchase price)	25,886.10	36,478.85
Total assets now		41,733.16
Total assets June 25, 1925		38,864.74
Gain for period		$ 2,868.42

DISTRIBUTION OF ASSETS

A. V. M. A.		
Cash	$ 246.75	
Bonds	13,445.93	
		$13,692.68

Journal Fund			
Cash	$ 5,007.56		
Bonds	10,459.91		
Time Deposit	10,000.00		
		25,467.47	
Relief Fund			
Bonds	$ 1,980.26		
Time Deposit	592.75		
		2,573.01	
			$41,733.16

Salmon Memorial Fund

Time deposit June 25, 1925		$ 3,991.54
Loans to Ladies' Auxiliary		900.00
Liberty Bond		500.00
Total assets June 25, 1925		5,391.54
Receipts		
Interest on time deposit	$ 171.88	
Interest on Bond	21.25	
		193.13
Amount of Certificate of Deposit December 31, 1925		4,184.67
Amount received from Ladies' Auxiliary for interest on loans		36.00*
Total assets		$4,220.67

Relief Fund

This fund was credited with $27.26 for interest on $565.49, the amount on time deposit, as shown by the report of the Treasurer for 1924-25.

Bond Recapitulation

Fund	Par	Cost
Association	$14,000.00	$13,445.93
Journal	11,000.00	10,459.91
Relief	2,000.00	1,980.26
	$27,000.00	$25,886.10

Emblems

Included in receipts credited to the A. V. M. A. Fund is $205.03, derived from sale of emblems during the period.

Receipts from Secretary

June 26 to December 31, 1925

1925			
Aug. 3	Received from Dr. H. P. Hoskins, A. V. M. A. and Journal Fund	$ 1,070.95	
Aug. 19	Received from Dr. H. P. Hoskins, A. V. M. A. and Journal Fund	4,312.01	
Sept. 19	Received from Dr. H. P. Hoskins, A. V. M. A. and Journal Fund	1,847.18	
Oct. 21	Received from Dr. H. P. Hoskins, A. V. M. A. and Journal Fund	1,287.29	
Nov. 17	Received from Dr. H. P. Hoskins, A. V. M. A. and Journal Fund	3,757.89	
Dec. 17	Received from Dr. H. P. Hoskins, A. V. M. A. and Journal Fund	3,930.03	
			$16,205.35

*This amount also placed on time deposit.

INTEREST COLLECTED

Nov. 17	Interest on Bonds (A. V. M. A.)	308.79	
Nov. 17	Interest on Bonds (Journal)	308.78	
Nov. 17	Interest, $7,000 (Journal)*	575.54	
Nov. 17	Interest, $565.49 (Relief)*	27.26	
			1,220.37
	TOTAL RECEIPTS		$17,425.72

DISBURSEMENTS

June 26 to December 31, 1925

ASSOCIATION FUND

June	17	Friesema Bros. Printing Co., printing booklets	$ 58.75
June	26	K. C. V. C. Alumni Ass'n., adv. in Alumni Quarterly	10.00
June	29	Frances Conley, salary—June 5-20	72.00
July	6	Dr. E. R. Steel, expenses, Sect. on General Practice	12.19
July	6	Dr. F. M. Hayes, expenses, Sect. on Education and Research	3.15
July	6	Book Building, rent for July	118.00
July	18	Mary Bell, salary—June 29 to July 18	87.50
July	31	Dr. H. P. Hoskins, salary for July	416.67
August	6	Dr. H. P. Hoskins, expenses to Portland convention	238.08
August	6	Dr. M. Jacob, expenses to Portland convention	233.34
August	6	Stubley Printing Co., printing Treasurer's report	41.00
August	6	Book Building, lettering on door of office	12.40
August	6	Schiffer Printing Co., envelopes, notices 1925-26 dues, programs	147.75
August	14	Dr. H. P. Hoskins, miscellaneous petty cash expenses	39.37
August	20	Globe-Wernicke Co., office equipment	78.45
August	21	Friesema Bros. Printing Co., printing booklets	40.00
August	27	Dr. L. A. Merillat, expenses attending meetings	248.00
August	27	Estora Whitaker, reporting of Portland convention	429.60
August	28	Dr. R. M. Williams, refund on application fee	7.00
August	31	Marion Samsell, salary—August 17-31	40.00
September	1	Book Building, rent for September	118.00
September	4	Dr. H. P. Hoskins, postage	33.38
September	5	G. H. Smith, preparing Treasurer's report	20.00
September	17	Marion Samsell, salary—September 1-17	46.15
September	23	K. C. V. C. Alumni Ass'n., adv. in Alumni Quarterly	10.00
September	24	Una Anderson, salary—Aug. 25 to September 24	100.00
September	30	Dr. H. P. Hoskins, salary for September	416.67
October	1	Schiffer Printing Co., printing booklets and stationery	79.25
October	1	Dr. H. P. Hoskins, expenses attending meetings	116.83
October	1	Book Building, alteration in office, partition	46.17
October	10	Cadillac Ribbon & Carbon Co., carbon paper	25.00
October	10	Dr. H. P. Hoskins, miscellaneous petty cash expenses	59.63
October	12	Dr. H. P. Hoskins, postage	61.84
October	13	Dr. J. C. Flynn, expenses, Sect. on Small Animal Practice	47.00
October	16	Dr. John W. Adams, expenses attending Lake States Conference	76.42
October	23	Una Anderson, salary—September 25 to October 24	100.00
October	29	Journal of the A. V. M. A., subscription for honorary members	90.00
November	2	Book Building, rent for November	118.00
November	3	Schiffer Printing Co., stationery	88.15
November	5	Wolf Detroit Envelope Co., envelopes	27.98
November	12	Jewel Emblem & Mfg. Co., emblems	91.46
November	13	Dr. John W. Adams, expenses attending meeting, Southeastern States Vet. Med. Asso	95.16

*Time deposits.

November	13	Dr. H. P. Hoskins, postage	55.93
November	16	Friesema Bros. Printing Co., printing booklets	47.20
November	24	Una Anderson, salary—October 25 to November 24	100.00
November	30	Schiffer Printing Co., envelopes, stationery	31.40
November	30	Dr. H. P. Hoskins, miscellaneous petty cash expenses	19.27
November	30	Dr. H. P. Hoskins, salary for November	416.67
December	5	Hazen, Lindsay & Carroll, premium on Treasurer's bond	140.00
December	7	Schiffer Printing Co., printing booklets	46.75
December	7	Dr. H. P. Hoskins, expenses attending meetings	74.63
December	8	Dr. John W. Adams, expenses attending meetings	104.87
		Total	$5,257.56

DISBURSEMENTS

June 26 to December 31, 1925

Journal Fund

June	22	Everton Engraving Co.	$ 78.89
June	22	Friesema Bros. Printing Co., reprints	97.10
June	29	Friesema Bros. Printing Co., printing July Journal	967.50
June	29	Dr. H. P. Hoskins, postage	30.53
June	29	Dr. H. P. Hoskins, salary for June	416.67
June	29	Alice Laverick, salary for June	135.00
July	1	Standard Mailing Machine Co., stamp affixer	29.40
July	11	Friesema Bros. Printing Co., reprints	22.88
July	31	Alice Laverick, salary for July	135.00
August	6	Schiffer Printing Co., envelopes	18.50
August	6	Friesema Bros. Printing Co., printing August Journal	967.12
August	6	Book Building, rent for August	118.00
August	6	Dr. H. P. Hoskins, postage	55.34
August	6	Globe-Wernicke Co., office equipment	109.52
August	18	Dr. H. P. Hoskins, sundry expenses	72.80
August	31	Alice Leverick, salary for August	135.00
August	31	Dr. H. P. Hoskins, salary for August	416.67
September	1	Everton Engraving Co., cuts	44.95
September	4	Schiffer Printing Co., envelopes	15.85
September	9	Friesema Bros. Printing Co., printing September Journal	963.75
September	16	Dr. H. P. Hoskins, postage	63.86
September	30	Alice Laverick, salary for September	135.00
October	1	Book Building, rent for October	118.00
October	1	Everton Engraving Co., cuts	14.65
October	2	Friesema Bros. Printing Co., reprints	90.88
October	12	Dr. H. P. Hoskins, postage	56.96
October	16	Friesema Bros. Printing Co., printing October Journal	964.12
October	29	Everton Engraving Co., cuts	25.45
October	29	Friesema Bros. Printing Co., reprints	31.04
October	31	Dr. H. P. Hoskins, salary for October	416.67
October	31	Alice Laverick, salary for October	135.00
November	3	Dr. H. P. Hoskins, miscellaneous petty cash expenses	45.78
November	5	Dr. H. P. Hoskins, postage	41.37
November	6	Friesema Bros. Printing Co., printing November Journal	953.75
November	24	Friesema Bros. Printing Co., reprints	44.14
November	30	Alice Laverick, salary for November	135.00
November	30	Everton Engraving Co., cuts	86.79
December	5	Book Building, rent for December	118.00
December	8	Friesema Bros. Printing Co., printing December Journal	963.00
December	8	Dr. H. P. Hoskins, postage	49.81
		Total	$9,319.74

ASSOCIATION MEETINGS

CALIFORNIA VETERINARY CONFERENCE

After having been postponed for a year, because of the presence of foot-and-mouth disease in the State, the annual California veterinary conference was held at the University Farm, Davis, January 5-8, 1926. One hundred thirteen veterinarians registered for the conference, Oregon and Nevada being represented.

A varied program, arranged cooperatively by the California State Veterinary Medical Association and the Division of Veterinary Science, University of California, was presented and included lectures and demonstrations by nationally known men.

The special lecturers included: Dr. R. R. Dykstra, Kansas State Agricultural College; Dr. H. M. Evans, Professor of Anatomy, University of California; Dr. K. F. Meyer, Professor of Bacteriology and Director of the Hooper Foundation for Medical Research; Dr. B. T. Simms, Professor of Veterinary Science, Oregon Agricultural College; Dr. J. A. Kiernan, Chief, Tuberculosis Eradication Division, U. S. B. A. I.; and Dr. C. A. Kofoid, Professor of Zoology, University of California. Federal and state officials, practitioners and members of the faculty of the University also contributed to the program.

The lectures and demonstrations given by Dr. Dykstra proved especially interesting to the practitioners. By using charts and formalin-hardened specimens, he was able to present the technic of a number of surgical operations in detail. Dr. Dykstra also offered some timely therapeutic suggestions for both large and small animal practitioners. Throughout his lectures he voiced a plea for the veterinarian to refine his technic when possible, not only for obtaining more satisfactory results, but for producing a better impression upon his clients.

"Salmon Poisoning of Dogs," presented by Dr. Simms, proved highly interesting and instructive, clinical and microscopical demonstrations of the disease featuring the program of the second day. Although the disease does not occur to any extent in California, much interest was shown, because of the splendid clinical material and the recently determined etiology of the affection. The clinical subjects, previously fed fluke-infested salmon, came down with typical symptoms of "salmon poison-

ing" at the scheduled time, providing abundant material for a detailed study of the condition.

Among the outstanding features of the program were the lectures by Dr. H. M. Evans, on "The Oestrus Cycle" and "Vitamin E and Animal Fertility." Dr. Evans' discovery of vitamin E is well known to the scientific world, and his lectures were filled with interesting observations and data relative to his subjects. All of his listeners were appreciative of the opportunity to hear his splendid lectures.

Dr. K. F. Meyer's review of "Two Years of Progress in Experimental Medicine" featured the last part of the program. In his usual capable manner, Dr. Meyer offered a summary of the work done during the past two years on some of the important diseases.

The discussion regarding evolution being at its height, Dr. Kofoid's discourse on "Biological Research in Relation to the Evolution Controversy in America" was well received and brought out facts which served to clarify many controversial points on the subject. Dr. Kofoid's sense of humor added greatly to the interest in his talk.

The program the last day consisted of a symposium on tuberculosis eradication. By means of large charts, Dr. Kiernan showed clearly the advance made in tuberculosis eradication in the United States, and his optimism regarding the ultimate outcome of the campaign left a marked impression upon his listeners. The film, "Out of the Shadows," by the U. S. Department of Agriculture, was shown to conclude this phase of the program.

In conjunction with the program, an adjourned meeting of the California State Veterinary Medical Association was held and the following officers elected: President, Dr. J. P. Bushong, Los Angeles; vice-president, Dr. L. A. Henrich, Corcoran; treasurer, Dr. James Boyd, San Jose; secretary, Dr. E. H. Barger, Davis.

One hundred dollars was subscribed by the Association toward the Schmidt Memorial Fund, which is being raised by the American Veterinary Medical Association.

The conference was fittingly closed by a splendid banquet, in Sacramento, at the Hotel Sacramento.

E. H. BARGER, *Secretary.*

Lexington! Let's Go!

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION

The twentieth annual meeting of the Mississippi State Veterinary Medical Association was held at Greenwood, January 18, 1926.

In addition to prominent veterinarians from various sections of Mississippi, there were a number of others from different parts of the country, veterinarians who are universally recognized as being among the leading live stock sanitarians, as well as leaders in various other national veterinary activities. In this number were Dr. F. W. Wood, of the Cutter Laboratory, Berkeley, Calif.; Dr. A. T. Kinsley, of the Kinsley Laboratories, Kansas City, Mo.; Dr. C. E. Salsbery, of the Jensen-Salsbery Laboratories, Kansas City, Mo.; Dr. H. Preston Hoskins, Secretary-Editor of the A. V. M. A., Detroit, Mich.; and Dr. Adolph Eichhorn, of the Lederle Laboratories, Pearl River, N. Y.

The meeting was opened with an invocation rendered by Rev. Frank R. Dunn. Hon. W. K. Clements, Mayor of Greenwood, delivered the address of welcome. Dr. W. P. Ferguson, of Grenada, responded.

The first paper presented was on the subject of "Anthrax Aggressin," by Dr. C. E. Salsbery, who reported on the results of the immunization, with aggressin, of about 20,000 animals against anthrax in the states of Mississippi, Arkansas, Louisiana and Texas, during the year 1925. This paper was followed by a general discussion, in which were brought out many of the shortcomings of the various anthrax biological products in general use.

Dr. A. T. Kinsley discussed the diseases of swine. He pointed out that his observations led him to believe that the South was not taking advantage of the great opportunities offered by raising more hogs. Dr. Kinsley urged the veterinarians to be the leaders in encouraging the raising of more swine in their communities. He dwelt at considerable length on the diseases of baby pigs and gave the veterinarians present the benefit of his wide experience and observations in connection with swine breeding and feeding. Dr. Kinsley stated that most of the losses among swine could be attributed to one of three things, either improper methods of breeding, feeding, or housing.

Dr. R. V. Rafnel, recently appointed state veterinarian of Mississippi, presented a paper on "Regulatory Measures for the

Control of Animal Diseases." By reason of certain local conditions, the subject was very freely discussed, particularly in relation to those states requiring serological tests for contagious abortion. Several veterinarians pointed out how the requirements of these states were being openly evaded and others pointed out the unnecessary expense and hardships being placed on shippers of live stock by the states requiring the tests. It was further pointed out that those veterinarians who were the closest students of the disease had frequently expressed the opinion that the test was absolutely unreliable for determining the status of individual animals. Following the discussion, a resolution was adopted, requesting the states in question either to repeal or modify the regulations.

The afternoon session was opened by an address by Dr. F. W. Wood on the subject of "Anthrax." Many points which had not been brought out in the morning discussion came up at this time. Dr. Wood was of the opinion that the careful and intelligent application of the newer anthrax vaccines would be followed by satisfactory results in those districts where the disease was such a problem.

Dr. H. Preston Hoskins addressed the Association on the various activities of the American Veterinary Medical Association and how they affected the veterinarians of Mississippi. Among the topics he discussed were publicity, state board reciprocity, liability insurance, the JOURNAL, Mississippi's numerical strength in the national organization, plans for the Lexington meeting, and the work of the Committee on Policy. Following his address, many questions were asked and an opportunity was given Dr. Hoskins for answering these.

Dr. Adolph Eichhorn concluded the afternoon session by conducting a question-box on the infectious diseases of animals. These questions pretty well covered the field of animal diseases and included contagious abortion, equine infectious anemia, rabies, tuberculosis, botulism, blackleg and canine distemper.

At the business session which followed, the following officers were elected for the ensuing year: President, Dr. M. J. Luster, Clarksdale; 1st vice-president, Dr. W. O. Hughes, West Point; 2nd vice-president, Dr. R. H. Stewart, Belzoni; secretary-treasurer, Dr. Wilbur McPherson, Jackson. Honorary membership was conferred upon Drs. F. W. Wood, H. Preston Hoskins and A. T. Kinsley.

In the evening the veterinarians and visitors enjoyed a delightful banquet at the Royal Palm Cafe. Dr. W. P. Ferguson, acting as toastmaster, called on a large number of those present for short speeches. It was decided to hold the 1927 meeting in Hattiesburg.

STATE VETERINARY MEDICAL ASSOCIATION OF TEXAS

The third semi-annual meeting of the State Veterinary Medical Association of Texas was held at the Texas Hotel, Fort Worth, January 20-21, 1926. The meeting was called to order in Hall Longhorn No. 3, at 10:00 a. m., Wednesday, President W. R. Sanderson presiding. Dr. N. F. Williams, state veterinarian, delivered the address of welcome. Being at home and knowing the ability for and the pride that Fort Worth takes in entertaining guests, and also knowing and loving the men of the profession in Texas as no other man does, Dr. Williams made about fifty veterinarians and their wives feel as though they had come home for a short stay.

In the absence of Dr. A. E. Flowers, of Dallas, who was unable to be present on account of sickness, Dr. A. T. Kinsley, of Kansas City, kindly consented to respond to Dr. Williams' address of welcome. To the men of the Association, Dr. Kinsley seems like an out-of-town father, and we were fortunate and happy indeed in having him with us for this meeting. When Dr. Kinsley takes the floor, he takes us back to the school lecture-hour, and gives advice that is worth taking back home and putting into practice. He discussed pharmaceutical specialties and the tendency to get away from what was taught us in school. He warned us against getting in the rut of just handing out cure-alls, hit or miss. Dr. Kinsley wants the profession to make their own diagnoses and depend on their own knowledge.

Dr. H. Preston Hoskins, of Detroit, Mich., followed Dr. Kinsley in a splendid talk on the work of the A. V. M. A. and, during the round-table discussion, answered a great many questions. The Dixie veterinarians do not have an official of the A. V. M. A. visit them very often, and they appreciated Dr. Hoskins' talk to the fullest. We hope Dr. Hoskins will come to us again soon, for we recognize the A. V. M. A. to be a big factor in our profession and, as Secretary, he is giving his very best efforts to all the different associations.

Then followed the address of the President, Dr. W. R. Sanderson, of Brownwood. Dr. Sanderson, in a splendid paper, reviewed history, paid tribute to the pioneers in veterinary work in Texas, outlined a good business policy for the future, urged loyalty and cooperation, and also gave a short history of the Women's Auxiliary. He spoke feelingly of its aims and purposes, and it was made plain to the Association that Dr. Sanderson has been and will be strong in making history for the profession in Texas.

Wednesday evening, the members and guests gathered in the Ball Room of the Texas Hotel and enjoyed a beautifully appointed and delicious banquet. Dr. N. F. Williams acted as toastmaster. Knowing well the vast experience and knowledge in the minds and hearts seated around the table, Dr. Williams soon had beautiful reminiscences and splendid speeches going.

The following papers were presented during the meeting:

"The Standard Milk Ordinance. Its Importance and Interpretation," by Dr. W. H. Haskell, Beaumont.

"Anthrax Aggressin," by Dr. C. E. Salsbery, Kansas City, Mo.

"Breeding Methods at the Army Remount Depot," by Capt. J. W. Worthington, Fort Sam Houston.

"Veterinary Medicine as a Life Pursuit for Young Men of Today," by Dr. T. O. Booth, Fort Worth.

"Poultry Practice," by Dr. P. P. Starr, Gainesville.

"The Veterinarian's Standing in His Community," by Dr. R. L. Rhea, San Antonio.

"Literary Review for 1925, Pertaining to Small Animal Practice," by Dr. H. V. Cardona, Fort Worth.

"Rabies Control Problem," by Dr. W. R. McCuistion, Fort Worth.

"Legal Status of Small Animals in Texas," by Dr. W. G. Brock, Dallas.

"Relation of Vitamins to Small Animal Diseases," by Dr. S. N. Blackberg, College Station.

Address, by Dr. H. L. Darby, B. A. I. Inspector-in-Charge, Fort Worth.

Following the papers, a small animal clinic was held, with Drs. W. G. Brock, of Dallas, and M. A. Peck, of Fort Worth, as clinicians.

A luncheon was served at the plant of Swift & Company. An

exhibit of pathological specimens was given by the B. A. I. veterinarians. Following this, a tour of inspection was conducted through the plant.

D. PEARCE, *Secretary*

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY

The forty-second annual meeting of the Veterinary Medical Association of New Jersey was held at New Brunswick, January 26-27, 1926, in conjunction with the third annual conference for veterinarians at the College of Agriculture. The meeting was largely attended by veterinarians from many states.

The success of the meeting was due, in a large measure, to the cooperation of Professor F. G. Helyar, director of short courses at the College, and to our President and the Committee on Arrangements.

The meeting was called to order by President A. W. Smith and included the motion picture, "Exit Ascaris." Next, Dr. Wm. Herbert Lowe presented a paper on "Advancement in Animal Industry." After a luncheon, Dr. Fred R. Beaudette presented the subject "Poultry Diseases."

Dr. R. R. Dykstra, of Manhattan, Kansas, presented a find paper on "The Farmer and the Veterinarian." Dr. J. S. Buckley, of the U. S. Bureau of Animal Industry, spoke on "Rabies and Control Measures." The majority of the veterinarians present entered into the discussions of these very fine papers.

The meeting then adjourned until evening, when a dinner was given, at which Dr. J. B. Hopper acted as toastmaster. Among the speakers of the evening were: Dr. A. W. Smith, Dr. Wm. Henry Kelly, of Albany, N. Y.; Dr. R. R. Dykstra, of Manhattan, Kans.; Dr. Wm. Herbert Lowe and Dr. J. Harry Hewitt, of Borden's Farm Products Company, Gouverneur, N. Y.

On the second day the following subjects were presented: "Surgery," by Dr. R. R. Dykstra; "Specific Cystitis and Pyelo-Nephritis in Cattle," by Dr. Frederick S. Jones, of the Rockefeller Institute, Princeton; "The Veterinarian and the City Milk Supply," by Dr. J. Harry Hewitt; and "Canine Distemper," by Dr. S. A. Goldberg, of the New York State Veterinary College.

At the business session, the election of officers for the ensuing year resulted in the re-election of all of the old officers.

GEO. P. ELLICE, *Secretary.*

ALABAMA SHORT COURSE FOR GRADUATE VETERINARIANS

The third annual short course for graduate veterinarians was held at the College of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, February 1-6, 1926. The course was opened on the morning of the first, with an address by the Dean of the College.

The first lecture and demonstration of the short course was given by Dr. Charles Murray, of Iowa State College, followed by a lecture and demonstration by Dr. E. L. Quitman, of Chicago, on gastrointestinal lavage. Dr. Quitman used four dogs in demonstrating his special apparatus for the removal of intestinal worms, foreign bodies, undigested food, feces, poisons, etc. During the short course, Dr. Murray held some five or six autopsies on dead chickens. Some of them exhibited lesions of nutritional diseases, due to a high nitrogenous diet. He lectured every morning and evening, for five days, on various diseases of poultry —roup, catarrh, canker, pox, aspergillosis, coccidiosis, *B. pullorum* infection, fowl cholera, fowl typhoid, nutritional diseases, sanitation, poultry houses, runs, etc. He also gave a very complete and interesting lecture on infectious enteritis in swine. Dr. Murray has done recent research work on this disease, and pointed out the new things in its pathology. He also gave talks on hog cholera, hemorrhagic septicemia and flu. Every veterinarian present was well pleased with the clear, concise and accurate way in which he explained the causes, lesions and methods of preventing and treating the poultry and swine diseases he discussed.

Dr. E. L. Quitman caught the interest of his listeners from the very beginning, and all were intensely interested in everything that he said and did. He took up the pitfalls and landmarks of the small animal practitioner. He enumerated a list of books that every small animal practitioner should have, and in all cases he specified the best instruments for specific operations. Dr. Quitman gave most excellent talks and lectures on canine distemper, running fits, internal and external parasites of dogs and cats, infectious enteritis in cats, methods of handling obstetrical cases in the bitch and urethral calculus operations in dogs. He gave clinical demonstrations on passing the catheter in dogs and male cats. He used the Hobday cat-catheter. The use of various drugs in distemper, obstetrics and the different

kinds and types of mange were explained in lectures and also exhibited in clinical cases. He gave one clinical demonstration of the use of a subcutaneous injection of an active purgative and heart stimulants to a mule with impaction of the colon and depressed heart action.

The president of the American Veterinary Medical Association, Dr. John W. Adams, came to Auburn to help make the short course the best ever. He worked and worked, and never wearied in his well-doings. He gave complete "word-and-drawing" lectures on cartilaginous quittor; tendon diseases and operations; umbilical, inguinal and scrotal hernias; urethral calculi in bulls; surgical diseases of the teat and udder in cows; cryptorchid operations in horses; prolapsus of rectum in pigs; laparotomy in the cow; rumenotomy in the cow, for diagnostic inspection of the rumen and for foreign bodies in the reticulum; operations on enlarged knee or carpus of cows; operations for amputating the second and third phalanges of the cow or ox; entropium and ectropium operations.

The operations Dr. Adams performed every afternoon were almost too numerous to mention. The major operations were: (1) umbilical hernia on boar pig; (2) scrotal hernia on boar pig, so as to save the pig for breeding purposes; (3) line-firing and point-firing tendons of mule; (4) inspection of ovaries of two sterile cows, in each of which he ruptured ovarian cysts; (5) rumenotomy in cow. Dr. Adams gave so much surgical instruction that he kept his audience busy taking notes, in order to retain the practical and valuable points he brought out.

Dr. W. E. Cotton, of the Bureau of Animal Industry, Washington, D. C., came to the short course to give a special lecture on foot-and-mouth disease. It was illustrated by moving pictures of the California and Texas outbreaks of 1924 and 1925. Dr. Cotton gave the differential characteristics of vesicular stomatitis, mycotic stomatitis and foot-and-mouth disease. He also gave a splendid lecture on the modes of transmitting infectious abortion in cattle, as well as excellent pointers on methods for the control and eradication of the disease from a herd.

Friday night, the veterinary students gave a banquet to all, and it was highly enjoyed by everyone. Saturday morning, a polyclinic was conducted by Drs. Murray and Quitman, and at the same time a special examination was given by the federal and state authorities to veterinarians who desired to be approved

for testing accredited herds. Saturday afternoon, some of the veterinarians visited the Booker T. Washington Negro School, at Tuskegee, Ala.

C. A. CARY.

IOWA VETERINARY ASSOCIATION

Iowa meetings have a reputation for being always good, but the 1926 meeting, held in Des Moines, February 2-4, was described generally as the greatest meeting of the Association. Including the visitors and ladies, there were approximately 500 in attendance. The meeting room was filled most of the time and appreciation was otherwise expressed for the program and the excellent way the contributors handled their subjects, many of the numbers being illustrated with lantern-slides or motion pictures. Thirty-five new members were taken in, bringing the membership up to practically 500. There were 28 ladies present, and they said they enjoyed this first meeting at which a ladies' program was provided; so this will probably be a regular feature of Iowa meetings in the future.

The first morning the meeting started with the President's address. A clear analysis of the veterinary situation was presented by Dr. C. J. Scott, who described it as optimistic. He asked for cooperation from all branches of the profession, especially with the practitioner, complete organization of the State, thorough qualification of veterinarians to handle all lines of work presented, and then publicity for the service they are able to offer the live stock industry.

The proposed changes in the constitution and by-laws and code of ethics proved interesting, especially the sections on raising the dues and the change in the code of ethics relative to advertising. The dues were raised to $3.00. In spite of the large membership, it has been found that the Association can not function at maximum efficiency with the dues at $2.00. The Association pays the expenses of officers and committees while engaged on special trips in the interest of the Association. This is considered well worth while, in order to secure the services of those who are willing to give their time for the good of the profession.

The change adopted dealing with advertising is as follows:

"In advertising, the veterinarian shall confine himself to his business address, in newspapers, on cards or stationery, and to such other advertising or publicity of an educational nature intended to inform the public of veterinary service without advertising prices or fees for medicines or

services. He shall not use the title 'assistant state veterinarian' or 'accredited veterinarian,' except in signing official papers, such as health certificates. He shall not advertise as 'specialist,' but may advertise 'practice confined to' the treatment of certain diseases or animals."

The Executive Committee, cooperating with a special committee on Publicity, will also put into operation a plan of publicity for the profession, as well as censor any material submitted for approval before being given publicity by a member, and handle complaints of violations of the new and more liberal code of ethics. The idea of paid publicity was regarded as something the Association should approach cautiously. A special assessment of $1.00 was made, to start the raising of funds to carry out some of the plans of the Committee on Publicity.

After the changes in the constitution and by-laws and code of ethics were adopted, a motion was adopted that the Association incorporate. To do this, all that is required in Iowa for a non-profit organization is to file a copy of the constitution and by-laws and code of ethics with the Recorder in the county where the Association's headquarters are located. These, with the application to the Court, prepared by an attorney, constitute the articles of incorporation. The liability of members for the acts of the Association is thus limited, and only the Association funds are affected by legal action, should the Association be sued.

The program started on the afternoon of the first day, with an illustrated lecture and question-box on small animal practice by Dr. J. C. Flynn, of Kansas City, Mo. This occupied almost two hours and was thoroughly enjoyed. "Rabies in Iowa" was discussed by Dr. D. M. Griswold, State Commissioner of Health, who advocated state-wide control of rabies and favored state-wide vaccination of dogs. Dr. E. M. Nighbert, of Queen City, Mo., gave a very instructive and practical talk on "General Sheep Practice." Dr. R. C. Moore, of St. Joseph, Mo., illustrated the anatomy of the udder and discussed "Surgical Treatment of Diseases of the Udder of Cattle." To remove newgrowths from the teat-canal and bottom of the milk-cistern, he advocated the slitting of the end of the teat about half an inch, or through the sphincter and skin also, and then removing the tumors with scissors, leaving the wound in the end of the teat open for drainage, which heals readily with little after-care.

The next morning, the program began with an illustrated description of "The Abdominal Viscera of the Ox," by Dr. G. W. McNutt, of the Iowa State College. Numerous slides showed the relation of the organs, and their locations were pointed out

from the standpoint of diseases in a very instructive way. Dr. F. E. Walsh, also of the College, read a splendid paper on "Common Disorders of the Digestive Tract of Cattle," in which he reviewed his experiences with the various drugs used and reported some experimental work on barium chlorid. Dr. L. P. Scott, of Waterloo, presented a very practical paper on "The Use of the Stomach-Tube in General Practice." Completing the morning program, Dr. G. E. Golden, B. A. I. inspector at Sioux City, gave an illustrated review of the outbreaks of foot-and-mouth disease as he had seen them in California and Texas, giving special attention to differential diagnosis.

The afternoon of the second day was devoted to a discussion of tuberculosis. A paper by Dr. R. A. Moye, of Manchester, entitled "Tuberculosis Eradication," dealt particularly with cooperation from the owner in buying new cattle and in cleaning and disinfecting. Dr. J. A. Barger, gave a very good extemporaneous talk on "Why Tuberculosis is Being Eradicated." Dr. Peter Malcolm presented a paper on "The Non-Reacting Tuberculous Cow," which dealt with means of detecting tuberculous animals other than by the test alone. An illustrated lecture on "Tuberculous Skin Lesions in Cattle," by Dr. L. Enos Day, of Chicago, showed how cattle contract skin lesions and also showed pictures of the lesions before and after slaughter. Dr. Robert Graham, of the University of Illinois, gave an illustrated lecture on "The Relation of Avian Tuberculosis to Tuberculosis of Pigs and Calves." Much new and interesting material was presented. Finally, Secretary of Agriculture M. G. Thornburg presented a report on "Veterinary Activities of the Department of agriculture."

One of the outstanding things in Secretary Thornburg's report was the statement that 230 practitioners had tested 634,230 cattle, and had been paid $122,365.00 during the year. This means that they had tested, on an average, 2,757 cattle; had received, on an average, $532.00; and had tested cattle at a cost, according to these figures, of 19 cents per head. The plan of using practitioners, in Iowa, has been worked out with the State Department of Agriculture and the federal office, through numerous conferences with Association officers, and it becomes apparent how satisfactory the plan is when it is realized that 230 of approximately 350 practitioners in the 52 counties have taken advantage of the privilege extended them. Practitioners test in their immediate communities, receiving $10.00 per day and

7 cents per mile, with tags and tuberculin furnished. They are not required to work more than two days a week, if they can not spare more time. This allows one day for injecting and one day for reading. An efficiency record is kept of every man's work, and practitioners are required to test as many cattle as full-time inspectors working under similar conditions. The records show that there is little or no difference, and the plan of using practitioners, with their valuable local influence, in conjunction with a full-time county inspector-in-charge, has proved highly satisfactory. The Iowa law has helped in making rapid progress in area work, and in the use of practitioners, for the counties which make a levy adopt the plan, and this is added to state and federal funds. Thus different counties, with different percentages of reactors, may carry on the work as rapidly as desired with available veterinarians. The use of practitioners gives elasticity to the employment of inspectors by the State, for they can be used only as funds permit, and practitioners, by being made a part of the movement, may have considerable influence, both in assisting in having the plan adopted and in securing necessary funds to carry on the work as rapidly as possible.

On the evening of the second day, a banquet and program in connection with it was held, to which representatives of the agricultural press and Iowa live stock organizations were invited as guests. These banquets and programs have proved very popular, indicated by the presence of 315 this year. They have added considerably to the prestige of the profession in the State, as well as being very encouraging to the members of the Association. Last year we had 100 members of the Legislature with us, and next year we shall probably have them with us again, as well as others, such as representatives of the press, live stock organizations, etc. Along this line, a movement has been started to organize an Iowa State Breeders' Association, and the Iowa Veterinary Association has been invited to be one of the units. At these banquets we have asked for nothing, but have simply tried to point out the value of veterinary service to the live stock industry and to the public, in an educational and interesting way. To get out our guests, we have found that the Association as an organization can do it better than to leave it to individual members, and the complimentary tickets have been paid for out of the treasury. Through the cooperation of all the veterinary agencies of the State, such as the Department of Agriculture,

the federal force, the Iowa State College and the practitioners, these occasions, we feel, can be made great agencies for good and a form of publicity of the highest ethical type.

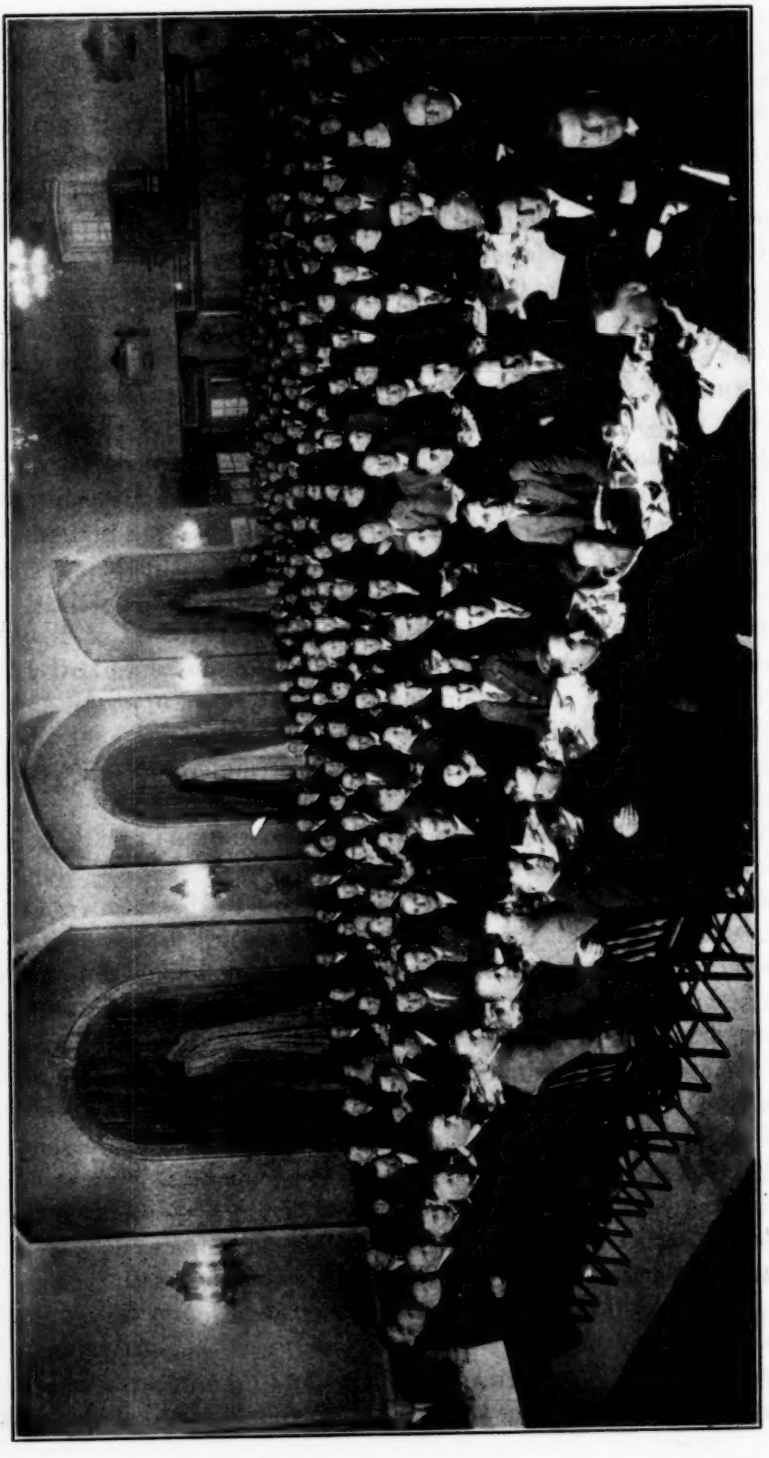
The first speaker, Mr. Royal H. Holbrook, of the Engineering Extension Division, in a very humorous and interesting manner, as a rapid-fire orator, told why Iowa is the greatest state in the Union and why its resources make it a great live stock center—"The largest piece of productive soil in all the world!"

Mr. Wilbur W. Marsh, Guernsey breeder, of Waterloo, spoke on "The Live Stock Industry and the Veterinary Profession," pointing out the economic situation in connection with the development of the pure-bred live stock business, and why an efficient veterinary profession was necessary in a program for making Iowa one of the foremost live stock centers in the world. His remarks, given in a sincere and eloquent manner, certainly were encouraging. Mr. Marsh is one of the most successful breeders in America, and has been given the honor of being the first Master Breeder, an honor accorded by the National Dairy Association. He promised the support of the breeders of Iowa in securing more recognition of the profession, higher standards of veterinary practice and opportunity for postgraduate study and research on animal diseases. He also condemned any activity which would tend to discourage the practitioner or lower the standard of veterinary service in any way. Veterinary service, he said, was a business matter and a necessity, a form of live stock insurance vital to successful agriculture.

The next speaker was Mr. John Thompson, of the *Iowa Homestead*, who discussed "The Agricultural Press and the Veterinary Profession." He pointed out methods through which the agricultural press and the profession of the State could cooperate for the benefit of the live stock industry, and he dealt in particular with the methods veterinarians could use in advising their clients concerning care and feeding of live stock.

Following his discussion, Dr. Robert Graham, of the University of Illinois, gave an illustrated talk on "Organizing a Bureau of Animal Industry in Haiti." He showed how impossible it is to develop a country, especially the live stock industry, without adequate veterinary service. His pictures illustrated the theme of the evening program—the relation of veterinary service to successful agriculture.

After the regular program, Dr. H. D. Bergman, the toastmaster, called on Mr. Sherman, a prominent Jersey breeder, of



1926 Banquet of Iowa Veterinary Association

Charles City; on the mayor of Sioux City; on Ex-Senator F. Larabee, of Fort Dodge; and on Mr. Hogue, Director of the State Budget, to make a few remarks. Dr. E. M. Nighbert dismissed the audience with one of his famous possum hunts.

The morning of the third day was started with an interesting paper, "Experiments in Poultry Vaccination," by Dr. S. H. McNutt, of Iowa State College. A group of practitioners discussed their methods of conducting poultry practice. They were Drs. F. J. Crow, Irving Moles, L. P. Miller and R. C. Mills. This was followed by a discussion of the plan being followed in Illinois for accrediting flocks for freedom from tuberculosis and white diarrhea, described by Dr. Robert Graham. Practitioners are doing the work and have charge of the accreditation, under state supervision.

Dr. H. E. Biester, of Iowa State College, presented an illustrated discussion on "The Pathology of Infectious Enteritis of Swine," which was of considerable interest, due to the importance this condition is assuming. The illustrations were very good and were well presented. Dr. A. C. Drach, of Omaha, presented a paper on "Swine Immunization Sanitation," which dealt thoroughly with the importance of the proper handling of swine, at time of vaccination, and of careful technic in doing the work.

In the afternoon, a group of splendid papers on genital diseases were presented as follows: "The Practitioner and the Abortion Problem," by Dr. John B. Bryant, Mount Vernon; "The Oestrus Cycle of the Mare," by Dr. W. A. Aitkin, Iowa State College; "Further Studies of Ovarian Extracts in Sterility," by Drs. H. S. Murphey and B. F. Zupp, also of the College.

A business session was then held. The Legislative Committee reported there had been no anti-veterinary legislation, which was rather a relief. The Veterinary Lien Bill was lost in the fight which developed over the gasoline and highway bills, although it had received favorable action up to that time. The Association extended to Secretary Thornburg thanks and appreciation for the consideration shown the profession in tuberculosis work and in prosecution of violations of the practice act, and the serum-and-virus law. It has been found that an injunction clause is needed to restrain violators of the practice act after they have been fined, so that they may be checked from further violations. A favorable opinion had been secured from the Attorney General's office, stating in effect that the taking of commissions constituted the same as a fee for practice, when peddlers sold remedies and

administered them. The prosecution of some of these numerous new-styled quacks, making them pay for losses incurred, will help check this evil. Other problems such as lay vaccination and activities of the Extension Department were discussed, with the situation optimistic.

The newly elected officers were: President, Dr. J. S. Potter, Iowa City; first vice-president, Dr. J. W. Haxby, Clarinda; second vice-president, Dr. F. B. Young, Waukee; secretary-treasurer, Dr. E. R. Steel, Grundy Center (re-elected). Executive Committee: Dr. C. J. Scott, Knoxville.

E. R. STEEL, *Secretary.*

IOWA CONFERENCE FOR VETERINARIANS

The eleventh annual conference for veterinarians was held at Iowa State College, Ames, February 5, 1926. The conference followed the annual meeting of the Iowa Veterinary Association and consisted largely of clinical demonstrations. The following program was presented:

Demonstration of normal, open and pregnant uteri, by the Department of Anatomy.

Demonstration of some of the newer apparatus and methods utilized in experimental physiology and pharmacology, by the Departments of Physiology and Pharmacology.

Demonstrations of lesions of poultry diseases; outlines of treatment; poultry parasites; laboratory test for white diarrhea; methods of housing, feeding and management, by the Departments of Pathology, Research and Poultry Husbandry, cooperating.

Demonstration of the pathology of sterility, by Dr. W. L. Boyd, University of Minnesota, St. Paul, Minn. Material provided and assistance given by the Departments of Surgery and Medicine.

About 200 veterinarians from Iowa and surrounding states were in attendance. During the forenoon they were free to spend as much time as they desired at any of the demonstrations, and were able to see and do for themselves the various things which are outlined in the program. In addition, a set of ten lectures on poultry feeding, housing and management; a compilation of the best treatment for poultry parasites; and notes on the technic of the agglutination test for white diarrhea, were given to each one.

In the afternoon, Dr. W. L. Boyd, of the University of Minnesota, gave an illustrated lecture on "The Pathology of Sterility," to the entire group, and followed this with a demonstration on diseased organs, which had been obtained from the packing-house.

Those in attendance expressed themselves as being very well pleased with the program and indicated that they would be glad to have more time given over to clinical demonstrations.

H. E. Bemis.

VETERINARY ASSOCIATION OF MANITOBA

The annual meeting of the Veterinary Association of Manitoba was held in Winnipeg, at the Royal Alexander Hotel, February 11, 1926.

At the business session conducted in the morning, the following officers were elected for the ensuing year: President, Dr. A. Alton, Portage la Prairie; vice-president, Dr. F. Skinner, Morris; secretary-treasurer, Dr. W. Hilton, Winnipeg. Examining Board: Drs. Alfred Savage, Winnipeg; Owen McGuirk, Dauphin; J. B. Still, Winnipeg. Auditors: Drs. R. Hanagan and J. D. McGillivray, of Winnipeg.

The register of the Association showed 134 active members and nine honorary members. After defraying all expenses for the year, the Association shows a balance of $692 to its credit in the bank. This is a splendid showing and without doubt it is one of the soundest veterinary associations in Canada. Two prosecutions were conducted during the year, one party having been fined $25.00 and the other $50.00 and costs. Prosecutions were carried out by the provincial government without expense to the Association.

The following resolutions were passed by the Association: (1) the supporting of harness racing in the province of Manitoba; (2) congratulating Dr. Chas. Little, of Winnipeg, graduate of the Ontario Veterinary College, 1872, on the event of his Golden Wedding recently; (3) congratulating Dr. J. P. Malloy on his promotion to the Canadian Senate; (4) that any member of the Association more than three years in arrears with his dues would be removed from the register, and if he continued to practice, prosecution proceedings would be taken.

Mr. J. H. Evans, deputy minister, province of Manitoba, gave an interesting address in connection with "The Live Stock Industry in Manitoba." Dr. A. Savage, of Winnipeg, addressed the meeting on "Abortion" which was illustrated by lantern slides and quotations. This brought about a very interesting discussion.

Dr. H. M. Thompson, of Virden, addressed the meeting on "The Use of Joint-Ill Vaccine."

Drs. Bishop, of Dauphin; B. C. Flook, of Ericsdale and S. H. Kesten, of Winnipeg, addressed the meeting on "Swamp Fever and Intestinal Parasites." Tuberculin testing from the practitioners' standpoint was discussed to a considerable extent.

Dr. J. B. Still spoke on "The Policies of the Department in Connection with the Eradication of Bovine Tuberculosis." Senator J. P. Malloy, V. S., addressed the meeting on "Veterinary Ethics," giving some sound advice in connection with same.

WILLIAM HILTON, *Secretary.*

BRITISH COLUMBIA VETERINARY ASSOCIATION

A general meeting of the British Columbia Veterinary Association was held at the office of the Health of Animals Branch, Vancouver, February 12, 1925, at 7:30 p. m. There was a good attendance of members. President J. G. Jervis occupied the chair. After the usual routine business of minutes and correspondence, some considerable discussion took place with regard to members who were several years in arrears with their dues. The Secretary reported that these members would have their names removed from the register.

The arrangements for the next meetng of the Northwestern Veterinary Association were discussed, and in compliance with the suggestions from the Washington and Oregon members, it was unanimously decided to hold the meeting on August 2-3-4, 1926. The British Columbia Association has promises of papers from some of the leading veterinarians in the Province.

The balance of the evening, at the Secretary's suggestion, was taken up with impromptu addresses and discussions by the members. Lots were drawn for the subjects, which were selected by the Secretary. The following subjects were presented: "Azoturia," by Dr. Ross; "Bovine Indigestion," by Dr. Howell; "Elbow Tumors," by Dr. T. E. Sleeth; "Unprofessional Conduct," by Dr. T. H. Jagger; "Eversion of the Uterus," by Dr. E. A. Bruce; "Your Stock of Drugs is Limited to Ten Varieties; Which Would You Choose and Why?" by Dr. W. Graham Gillam; "Are You in Favor of Dispensing Your Own Medicines? Give Your Reasons, For or Against," by Dr. A. Findlay; "Hernia," by Dr. A. J. Damman; and "Should a City or Municipal Veterinarian be Subservient to the M. H. O., or Should He be Directly Responsible to the Civic or Municipal Authorities?" by Dr. F. W. Ottewell.

No one gibbered or balked at his subject, and the result was a very enjoyable and instructive evening.

W. GRAHAM GILLAM, *Secretary.*

FLORIDA STATE VETERINARY MEDICAL ASSOCIATION

The Florida State Veterinary Medical Association met in the De Soto Hotel, Tampa, February 12-13, 1926. The meeting was called to order by Dr. J. V. Knapp, president.

The first paper on the program was given by Dr. D. C. Gilles, of Gainesville, on "Poisonous Plants of Florida." Dr. Gilles gave a description of the various poisonous plants found in Florida, together with the symptoms produced by such poisoning. He gave a case report on two outbreaks of poisoning from some of the poisonous plants. His discussion was very interesting and instructive. The Association voted that a copy of the paper by Dr. Gilles be sent to each veterinarian of Florida.

The next paper was given by Dr. D. A. Sanders, of the Experiment Station at Gainesville, his topic being "Poultry Diseases, Parasites, and Postmortem Examination." Dr. Sanders discussed the various poultry diseases found in Florida, and showed specimens of some of the most important poultry parasites found in this State. He gave quite a complete discussion on Manson's eye-worm, a poultry parasite found only in Florida, and one which is very important in this State. Dr. Sanders closed his discussion by holding a postmortem examination on a bird, pointing out the various lesions of diseases found in the different parts of the body.

The afternoon session was held in the veterinary hospital of Drs. Link and Applegate. Dr. J. F. DeVine, of Goshen, N. Y., was given the entire afternoon session for the purpose of lecturing on the diagnosis of pregnancy and diseases of the generative organs of the female. The veterinarians of Florida were indeed fortunate in having Dr. DeVine with them. Dr. DeVine, in his characteristic, clear and concise way, presented this important subject to the interest of every veterinarian present. Following his lecture, he gave a clinical demonstration of the examination for pregnancy and also for diseases of the generative organs. Dr. Applegate had provided several specimens of the generative organs from the packing-house; these specimens were used by Dr. DeVine in his discussions.

There were no evening sessions, for the South Florida Fair was being held at this time, and an opportunity was given the veterinarians to take in the entertainment features of this wonderful exhibit.

The session on the morning of February 13 was begun with a question-box discussion, led by Dr. H. C. Nichols, of Ocala. There were many helpful points brought out in this discussion. Practically every member present entered in the discussion. The Association has always made free use of the question-box method of discussions, and has found it very instructive.

Dr. J. F. DeVine and Dr. Maurice C. Hall, of Washington, D. C., were made honorary members of the Association.

The Association suggested to the Executive Committee that the next meeting be held in Miami, during the summer months. The following officers were elected for the year: Dr. Thos. J. Mahaffy, Jacksonville, president; Dr. F. G. Martin, Lakeland, vice-president; Dr. A. L. Shealy, Gainesville, secretary-treasurer.

A. L. SHEALY, *Secretary.*

NEWS ITEMS

Two cases of human anthrax were recently reported to the Haverhill (Mass.) Board of Health.

Chicago closed her doors, on April 1, to any milk not coming from cows that have passed the tuberculin test.

Dr. Mark White, Chicago's widely known goitre specialist, was recently fined one hundred dollars and costs, in Ashland, Ohio, for practicing without a license.

The quarantine which has been in effect in southeastern Texas, since July 30, 1925, on account of foot-and-mouth disease, was raised on April 1, there having been no sign of the disease since October.

Professor Franz Benesch, of the Vienna Tierarzliche Hochschule, is spending a few months under the auspices of the International Education Board at the New York State Veterinary College at Cornell University, for clinical study, especially in obstetrics. While in America he will spend a few weeks with Dr. W. L. Williams in the study of obstetrics in mares, in Lexington, Ky.

NECROLOGY

LINDNEY R. HUFFMAN

Dr. L. R. Huffman, of Old Union, near Paris, Kentucky, died March 27, 1926, after an illness of several weeks. He was in his 69th year.

After he was graduated from the Ohio Veterinary College, in 1893, Dr. Huffman located in Bourbon County and practiced there for many years. With one of his brothers, James H., Dr. Huffman was interested in breeding large-type Poland China hogs, at their farm on Russell Cave Pike, just south of Centerville.

Dr. Huffman joined the A. V. M. A. in 1916. He is survived by a sister and three brothers.

JOHN L. McGRATH

Dr. John Lester McGrath, of Pittsburgh, Pa., died suddenly, April 1, 1926, in his 33rd year. He was a native of Missouri and was graduated from the St. Joseph Veterinary College. Since coming to Pennsylvania he had been managing veterinarian of the Werntz Memorial Cat and Dog Hospital. Dr. McGrath was successful professionally, a good citizen and quite active in Masonic circles. He is survived by his widow, his aged parents and grandfather.

CORNELIUS C. WEEKS

Dr. Cornelius (Neal) Campbell Weeks, formerly of Lovington, Ill., and Washington, D. C., died at his home in Boise, Idaho, July 29, 1925, after an illness of several weeks. He had been in poor health for some time and had gone west for the benefit of his health.

Dr. Weeks joined the A. V. M. A. in 1915. He was a graduate of the United States College of Veterinary Surgeons, class of 1906. He was a veteran of both the Spanish American and World wars, having served in the latter with the rank of Captain. He is survived by his widow, three brothers and three sisters.

MARRIAGES

Dr. John J. Shelly (U. P. '20), of Bethlehem, Pa., to Miss Lillian J. Bartleson, of South Sterling, Pa., March 11, 1926.

Dr. J. Stotchik (Corn. '16), of Bastrop, Texas, to Mrs. M. B. Eckel, of Fort Worth, Texas, April 2, 1926.

Yes—Suh! Lexington, Ky., Aug. 17-18-19-20, 1926

BIRTHS

To Dr. and Mrs. C. M. Smith, of Wakefield, Kans., a son, David Lee, January 22, 1926.

To Dr. and Mrs. J. J. McClure, of Gurnea, Ill., a daughter, Phyllis Dene, February 14, 1926.

To Dr. and Mrs. Thos. J. McCabe, of Cedar Rapids, Iowa, a son, Thomas, Jr., February 18, 1926.

Lexington! Let's Go!

PERSONALS

Dr. Carl J. Fox (Mich. '26) has located for practice at Standish, Mich.

Dr. Harry L. Downey (Mich. '26) is planning to locate at Martinsville, Ill.

Dr. Horace B. F. Jervis (Ont. '04) is manager of Thusworth Farm, Wassaic, N. Y.

Dr. R. P. Ballentine (U. P.), of Miffintown, Pa., is remodeling his home and office.

Dr. Harry Jones (Chi. '94) is back in Deer Lodge, Mont., after a stay in Missoula.

Dr. W. A. Ewalt (Ont. '07), of Mt. Clemens, Mich., spent the winter months in Florida.

Dr. D. F. Eggers (McK. '08), of Elmhurst, Ill., recently completed building a new home.

Dr. W. C. Scholty (Iowa '02) is located at Alton, Iowa, on tuberculosis eradication work.

Dr. Robert S. Armstrong (Mich. '26) has selected DeWitt, Mich., as a location for practice.

Dr. J. C. Brown (Ont. '15) is back at his old location in Markham, Ontario, after a stay in Burford.

Dr. C. H. Atkinson (Wash. '20) has again been transferred, this time from Modesto to Newman, Calif.

Dr. H. J. Bird (O. S. U. '19) has removed from Cuyahoga Falls, Ohio, to 917 East Market St., Akron, Ohio.

Dr. M. J. Kellam (Ont. '93), of Winnipeg, was a visitor to the province of Ontario during the month of March.

Dr. Daniel R. Kohler (Ont. '93), of Boyertown, Pa., paid a visit to his Alma Mater, the first week in April.

Dr. N. J. Pearce (K. C. V. C. '13), formerly of Bentonville, Ark., is now at 1019 North Sixth Street, Fort Smith, Ark.

Dr. D. B. Pellette (K. S. A. C. '12) has removed from Monroe, La., and is now at 8414 Panola Street, New Orleans, La.

Dr. J. Dunn (Ont. '15), of Barrie, Ontario, has removed to New Liskeard, Ontario, where he reports that "business is good."

Dr. J. J. Jones (Gr. Rap. '13) has requested a change of address, from Indian Head, Md., to La Plata (Charles County), Md.

Dr. H. L. Van Volkenberg (Corn. '18) has requested a change of address, from Springville, N. Y., to Albion, N. Y., R. F. D. No. 6.

Dr. J. A. Fries (Gr. Rapids '13), of Durand, Mich., who recently underwent an operation at the local hospital, has resumed his practice.

Dr. Guy S. Jones (Iowa '17) has requested that his JOURNAL be sent to Lohrville, instead of Rockwell City, Iowa, where he has been stationed for some time.

Dr. Robert Graham (Iowa '10), of the University of Illinois, addressed a meeting of Du Page County dairymen, at Aurora, April 2, on diseases of dairy cows.

Dr. A. G. Stanford (Gr. Rap. '11), of Clay City, Ill., writes that he was sick all winter, having suffered from three attacks of pneumonia since November 8, 1925.

Dr. F. W. Chamberlain (Corn. '06), candidate for mayor of East Lansing (Mich.), on the Independent ticket, gave his opponent a close run in the recent election.

Dr. C. A. Nelson (K. C. V. C. '08), of Brainerd, Minn., sailed from New York, April 29, on the Swedish-American Line S. S. *Gripsholm*, for a visit to the Scandinavian countries.

Dr. F. F. Saint (Ont. '18), of Winnipeg, Man., is temporarily stationed in British Columbia, engaged in area testing for the eradication of bovine tuberculosis in the Fraser Valley.

Dr. Joseph Patt (K. C. V. C. '93), of Mobile, Ala., will sail from New York for Paris, May 18, on the North German Lloyd S. S. *Columbus*. He will not return until about October 1.

Dr. Ashe Lockhart (K. C. V. C. '15), of Kansas City, Mo., accompanied by Mrs. Lockhart, started on an automobile trip to his old home, in North Caroline, about the middle of April.

Dr. Wm. Henry Kelly (N. Y. C. V. S. '89), of Albany, N. Y., accompanied by Mrs. Kelly and their daughter, Ruth, recently took a trip to Bermuda, where they remained for about two weeks.

Dr. F. M. Cowden (K. C. V. C. '17), formerly of Oakland, took over the practice of Dr. L. W. Crumbough (K. C. V. C. '11) at Craig, Nebraska, March 1 and is now located at the latter place.

Dr. Chas. D. Morrow (O. S. U. '23) has been elected permanent and full-time executive secretary of the Dairymen's Credit Association, with headquarters at 711 First National Bank Bldg., Fort Wayne, Ind.

Dr. C. C. Mix (Ont. '04-Chi. '06), of Battle Creek, Mich., is recovering from a fracture of the arm, reported to have been sustained while skating, in an effort to reacquire some of his youthful skill in that direction.

Dr. E. T. Hallman (A. P. I. '10), of the Michigan State College, after serving for six years as alderman on the Common Council of East Lansing, has voluntarily withdrawn from politics in order to devote all of his energies to pathology.

Dr. John B. Lentz (U. P. '14), of Amherst, Mass., has been appointed a member of the Massachusetts State Board of Veterinary Medical Examiners, to fill the vacancy caused by the death of Dr. Thomas E. Maloney, reported in the April issue of the JOURNAL.

Dr. R. R. Birch (Corn. '12), who is in charge of the Veterinary Experiment Station of the New York State Veterinary College at Cornell University, sailed for Copenhagen, March 20. Dr. Birch will devote several months of study to infectious abortion in cattle.

Dr. Wm. E. Muldoon (Corn. '13), of Peru, Ind., recently received a great deal of newspaper publicity, following a dental operation performed on a hippopotamus, belonging to a circus with winter quarters at Peru. Six inches were removed from each of ten tusks.

Dr. E. E. Wegner (Wash. '07), dean of the College of Veterinary Medicine, State College of Washington, delivered the main address at the Founders' Day exercises, held at the College, March 31, marking the thirty-seventh anniversary of the founding of the institution.

Dr. Stephen Lockett (U. P. '06), of Montpelier, Jamaica, sailed for the United States, April 6, on a three-month leave of absence. Dr. Lockett has been employed by the British Government for the purpose of eradicating foot-and-mouth disease on the island of Jamaica, where it had become established. Through the thorough and untiring efforts of Dr. Lockett, the infection has been completely eradicated. He will pursue studies in advanced veterinary medicine at the University of Pennsylvania, having indicated his intention to register for a number of the graduate courses, offered in that institution.

Dr. M. F. Barnes (U. P. '11), formerly director of the Pennsylvania Bureau of Animal Industry Laboratory, has not severed his connection with the Bureau, as many were led to believe after reading the personal in the February number of the JOURNAL. His resignation as director of the Laboratory was to enable him to devote more time to the special study of bovine infectious abortion, which he has been conducting for the last six years, and also to do other special work for the Bureau. He has had many inquiries as to his address, which has not been changed. Dr. Barnes has had several calls from Pennsylvania and other states to give talks to breeders and veterinarians on bovine infectious abortion and other breeding diseases of cattle. On February 2, he talked before the Massachusetts Guernsey Breeders Association, and on February 16, before the University of Illinois Veterinary Conference. He has several requests to appear before meetings in the near future.

Lexington! Let's Go!